

**FACULTIES OF THE UNIVERSITY
OF PRETORIA**

HUMANITIES

EDUCATION

NATURAL, AGRICULTURAL AND INFORMATION SCIENCES

LAW

THEOLOGY

ECONOMIC AND MANAGEMENT SCIENCES

VETERINARY SCIENCE

HEALTH SCIENCES

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ENGINEERING AND THE BUILT ENVIRONMENT

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FACULTY OF NATURAL, AGRICULTURAL AND INFORMATION SCIENCES

PART I **(this publication)**

School of Mathematical Sciences

- Mathematics and Applied Mathematics
- Statistics
- Assurance and Actuarial Science

School of Physical Sciences

- Physics
- Chemistry
- Geography
- Earth Sciences

School of Information Technology

Informatics
Information Sciences
Computer Science

Home Economics

PART II **(separate publication)**

School of Biological Sciences

- Biochemistry
- Genetics
- Microbiology and Plant Pathology
- Physiology
- Botany
- Zoology and Entomology

School of Agricultural Sciences

- Agriculture Economics, Extension and Rural Development
- Animal and Wildlife Sciences
- Food Science
- Plant Production and Soil Science

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**FACULTY OF NATURAL, AGRICULTURAL AND INFORMATION SCIENCES
ACADEMIC PERSONNEL AS ON 30 JUNE 1999**

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Department of Chemistry

Modro, T.A., MSc DSc(Lodz) PhD(Polish Academy)	Professor (Head)
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Rohwer, E.R., BSc(Hons) MSc(Stell) PhD(RAU) Pr Sci Nat ...	Professor
Van Rooyen, P.H., BSc(Hons) MSc PhD(RAU)	Professor
Van Staden, J.F., BSc(Hons) MSc(UOVS) DSc(Pret) FRSC ...	Professor
Vleggaar, R., MSc DSc(Pret)	Professor
Wessels, P.L., MSc(Stell) PhD MBL(Unisa)	Professor
De Waal, D., MSc PhD(Pret)	Associate Professor
Modro, A.M., MSc(Lodz) PhD(Gdansk)	Associate Professor
Schoeman, W.J., BCom(Unisa) MSc DSc(Pret) Dipl Management (National Education)	Associate Professor
Strydom, C.A., BSc(Hons) MSc(PU vir CHO) PhD(Pret)	Associate Professor
Bauermeister, S., MSc PhD(Pret)	Senior Lecturer
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Venter, E.M.M., MSc(Pret) PhD(RAU) Pr Sci Nat	Senior Lecturer
Chantson, J.T., MSc(UPE)	Lecturer
Hassett, A.J., BSc(Unisa)	Snr Research Officer

Department of Physics

Malherbe, J.B., MSc DSc(Pret)	Professor (Head)
Friedland, E.K.H., MSc DSc(Pret)	Professor Extraordinary
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Auret, F.D., MSc DSc(Pret) Pr Sci Nat	Professor
Brink, D.J., MSc(PU vir CHO) DSc(Pret)	Professor
Carter, R.M., BSc(Hons) PhD(Witwatersrand)	Professor
Gaigher, H.L., MSc DSc(Pret)	Professor
Miller, H.G., MA(New York) Dr Habil(Frankfurt) PhD(Saskatchewan)	Professor
Bredell, L.J., BSc(Stell) MSc DSc(Pret) Pr Sci Nat	Associate Professor
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Kunert, H.W., MSc(Poznan) PhD(Warszawa)	Senior Lecturer
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Meyer, W.E., MSc(Pret)	Lecturer

Department of Geography

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Department of Computer Science

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Gräbe, P.J., MSc(Pret) Dr Phil Nat(Frankfurt)	Professor
Penning, F.D., MSc DSc(Pret)	Professor
Pretorius, L.M., MSc DSc(Pret)	Professor
Rosinger, E.E., MSc Dr Sc(Bucharest)	Professor
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Nat, Agric and Info Sciences I

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Centre for Science Education

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Rogan, J., BSc(Wits) THED(JCE) BA(Unisa) MA(Columbia) PhD(University of California)	Professor (Manager)
Ndlalane, T.C., BA(Unizul) UED(Unizul) BEd(Natal) MEd Science Edu(Univ Leeds)	Senior Lecturer

Faculty Administration

Beresford, M., Mrs	Head
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GENERAL INFORMATION

Admission

Any person who wishes to register at the University for the first time, or after an interruption of studies, should apply or reapply for admission. Application for admission to all courses closes on 30 September.

Selection

A selection procedure takes place prior to admission to the following degree courses in the Faculty of Science:

(a) **All undergraduate degree courses**

(b) **Postgraduate Courses**

BSc(Hons) with specialisation in Chemistry. Applications close on 30 November.

BSc(Hons) Mathematical statistics: Admission test is required.

BSc(Hons) Mathematical sciences: Admission test is required.

Statement of symbols

When registering at this University for the first time, a candidate has to submit a record of symbols obtained for each subject in the matriculation examination.

Medium of instruction

In conducting its business, the University uses two official languages, namely Afrikaans and English. In formal education, the medium of instruction is either Afrikaans or English, or both of these languages, provided that there is a demand and that it is academically and economically justifiable. However, it remains the student's responsibility to ascertain on an annual basis in which language a course and any further level of that course is presented. In respect of administrative and other services, a student has the right to choose whether the University should communicate with him or her in Afrikaans or English.

Courses offered in English as well as Afrikaans in the Faculty of Natural, Agricultural and Information Sciences

Chemistry: CMY 131; 141; 112, 122, 151, 214, 284. For Engineering: CHM 116, 216, 312.

Physics: PHY 171, 131, 181. The second semester is presented only in English. For Engineering: FSK 116, 126. Only in English PHY 113, SCI 161,162.

Computer Science: COS 110, 160, 212, 213, 221, 222, 283, 284, 314, 332, 333, 341, 343. Only in English: COS 324. For Engineering: RNV 210, ERP 210.

Geography: All courses listed under Geography in Sc.4 (Geography).

Mathematics: WTW 101, 102, 114, 115, 126, 128, 134, 144, 211, 215, 218, 220, 221, 228, 286. Only in English: WTW 152, 162, 215, 289, 312, 332.

Geology: GLY 243, 318, 381, GTX 311, 321, 325. Only in English: GLY 313, GMI 210, GTX 314.

Mathematical Statistics: All courses listed under Mathematical Statistics in Sc.4.

Meteorology: WKD 111; 112; 121; 122.

Bursaries and loans

Particulars of bursaries and loans are available on request.

Accommodation

Applications for accommodation in university residences for a particular year should be submitted as from April 1 of the preceding year. Applications will be considered as long as vacancies exist, and prospective students are advised to apply well in advance. Please note that admission to the University does not automatically mean that lodging will also be available.

Open day and orientation

Details of the open day to which all parents are cordially invited, and the subsequent orientation week during which all new first-year students must be present, are obtainable from the Dean of Students, University of Pretoria 0002.

Prescribed books

Lists of prescribed books are not available. The appropriate lecturers will supply information regarding prescribed books to students at the commencement of lectures.

Amendment of regulations and fees

The University retains the right to amend the regulations and to change course fees without prior notification.

NB: The University of Pretoria is phasing in a new system of education and learning during 2000, which will meet the requirements set out in SAQA guidelines (South African Qualification Authority) and in the NQF (National Qualification Framework). This entails the implementation of training programmes that will be outcome-based and market-orientated.

This system will be implemented in the Faculty during 2001. Students who have registered for a degree or diploma in this Faculty before 2000, or who register for 2000, will be enabled to complete the studies for the qualification. Should a student who registered before 2000, wish to change over to the a new programme, permission may be obtained in consultation with the programme manager for the new programme. However, the student will have to meet all the requirements required for the new qualification.

As a result of the phasing-in of this new system, information in this publication may not reflect the very latest developments in the Faculty. Problems should be taken up with the Faculty Administration.

Definition of terms

Familiarise yourself with the following terms. They are used generally in all faculties.

academic year: the duration of the academic year which is determined by the University Council and consists of two semesters

course: a selected division of a subject deemed to be a unit and to which a course code is allocated

course code: consists of an equal number of capitals and digits, which indicate the name of the course, the year of study, the period of study and the level of the course

curriculum: a series of courses grouped together from different subjects over a specified period of time and in a certain sequence according to the regulations

examination mark: the mark a student obtains for an examination in a course, including practical and clinical examinations where applicable. If necessary, the examination mark is finalised after ancillary examinations have been completed

extended study programme: a study programme for a degree or diploma which is completed over a longer period than the minimum duration of the particular degree or diploma

extramural study: classes attended after hours by students who register for the curriculum of a first degree or diploma that is presented over a longer period than the minimum duration indicated in the regulations for the particular degree or diploma

final mark: the mark calculated on the basis of the semester/year mark and the examination mark a student obtained in a particular course according to a formula which is determined from time to time in the regulations for each course with the proviso that should no semester/year mark be required in a course, the examination mark serves as the final mark

GS: a combined mark (semester/year mark plus examination mark) of at least 40% which is required for admission to a particular course

level of a course or level: the academic level of a course which is indicated in the course code

module: a portion of a semester course

registration: the process a candidate is required to complete to be admitted as a student of the University or for admission to a course

regulation for admission: a regulation drawn up by the Dean of the Faculty regarding the admission of students to the faculty. It includes a provision regarding the selection process

semester course: a course that extends over one semester

semester/year mark: the mark a student obtains during the course of a semester or a year for tests, class-work, practical work or any other work in a particular course as approved by regulation

subject: a demarcated field of study of which one course or more may be chosen for a degree

syllabus: the division of the study material for a specific course, according to the regulations

year course: a course that extends over one year (two semesters)

REGULATIONS AND CURRICULA

1. Admission to undergraduate study

1.1 General

- (a) To register for a first bachelor's degree at the University, a candidate must, in addition to the required matriculation exemption certificate, comply with the specific admission requirements for particular courses and fields of study as prescribed in the admission regulations and the faculty regulations of the departments.

It is expected of every first year student who wishes to register at the University of Pretoria, to complete a language proficiency test. Based on the results of this test, the student will be enrolled in language development courses that have to be passed before the degree will be awarded. In exceptional circumstances the language development course may be substituted by other courses as approved by the Dean.

- (b) The following persons may also be considered for admission:
- (i) A candidate who is in possession of a certificate which is deemed by the University to be equivalent to the required matriculation certificate with university exemption.
 - (ii) A candidate who is a graduate from another tertiary institution or has been granted the status of a graduate of such an institution.
 - (iii) A candidate who passes an entrance examination, which is prescribed by the University from time to time.

Note: A conditional exemption certificate does not grant admission to bachelor's study. However, in certain circumstances some of the faculties do accept a conditional exemption on the basis of mature age. Candidates are advised to contact the specific faculty administration in this regard.

A candidate without matriculation exemption may apply for admission to undergraduate studies on the prescribed form, provided that he or she reaches the age of 23 by 31 December of the year in which he or she wishes to commence studies, and provided that they have passed four approved matriculation subjects, with at least one subject at higher grade (with the exception of a second language), as well. The application form is available on request. However, all such candidates will be required to write a potential test. The final decision regarding admission will be based on the results of the potential test.

- (c) The Senate may limit the number of students allowed to register for a course, in which case the Dean concerned may, at his own discretion, select from the students who qualify for admission those who may be admitted.
- (d) Subject to other regulations and the stipulations of General Regulations g.1.3 and G.62, a candidate will only be admitted to study for the postgraduate degree if he or she holds a bachelor's degree.

1.2 Requirements for specific courses

A candidate who has

- (a) passed the Grade 12 examination in Computer Studies with at least 50% (D) at higher grade, as well as in Mathematics with at least 50% (D) at higher grade at standard grade, obtains admission to the course COS 110 in Computer Science. (These candidates may not register for CIL 171, 172, 173 (6 credits) and/or COS 160). A candidate who has passed at standard level with an A, B, C or D symbol, may not register for CIL 171, 172, 173. A candidate who has passed the courses CIL 171, 172, 173 (or INF 151) and COS 160 (or equivalent as determined by the Head of Department) can register for COS 110 in Computer Science. In exceptional circumstances, a candidate who does not meet the admission requirements, may, receive permission from the Head of Department to register for COS 110 on the basis of academic achievement and/or applicable experience acquired in practice. A candidate who does not comply with the admission requirements for Computer Science, or who did not pass the Grade 12 examination in Computer Studies, may be admitted to COS 110, depending on the results of a special admissions test that can be taken before the start of the academic year, only if the admission requirements for Mathematics have been met. Applications to take this test can be submitted at the Computer Science Department;
- (b) passed the Grade 12 examination in Mathematics with at least 40% at higher grade or at least 50% at standard grade, obtains admission to the courses GLY 151 and 152 in Geology;
- (c) passed the Grade 12 examination in Mathematics with at least 40% at higher grade or at least 50% at standard grade, or at least 50% in Geography at higher

- grade, obtains admission to the courses GGY 151, 132, 161 and 162 in Geography;
- (d) passed the Grade 12 examination in Mathematics and Physical Science at higher grade with at least 50%, will be admitted to the courses in Chemistry, namely CMY 112, 122, 131 and CMY 141 and the courses in Physics, namely PHY 131, 171 and PHY 181 ;
 - (e) obtained full matriculation exemption, obtains admission to PHY 113 and SCI 121;
 - (f) passed the Grade 12 examination in Mathematics with at least 50% at higher grade ,will be admitted to WTW 114, WTW 134 in Mathematics and to WST 151, 152 in Mathematical Statistics;
 - (g) passed the Grade 12 examination in Mathematics as well as Physical Science with at least 50% at higher grade, will be admitted to Molecular and Cell Biology and a course in the subjects Zoology and Entomology, Genetics, Microbiology or Botany;
 - (h) passed the Grade 12 examination in Mathematics with at least 40% at higher grade or at least 50% at standard grade (or at least 50% in Statistics 151, 153 and 152, 163), will be admitted to (i) Statistics 151, 152, 161 and a course in the subjects Informatics (excluding INF 153,154, 163, 164 and 253, 263) or Statistics and (ii) courses in Business Management, Economics, Marketing Management and Financial Accounting on 200 level;
 - (i) passed the Grade 12 examination in Mathematics with at least 50% at higher grade or 60% at standard grade, or alternatively at least 40% at higher grade or 50% at standard grade in Mathematics, as well as at least 60% at higher grade or 70% at standard grade in the Grade 12 examination in Computer Studies, or obtained an average of at least 60% in Statistics 151, 152 (or 50% in Statistics 151, 153 and 152, 163) and 161, 162 will be admitted to Informatics 170 and 270.
 - (j) registers, may write an exemption test for module FRK 151 on the work covered in grade 12 (matric) for the subject Accountancy. Should this test be passed, the student will be exempted from module FRK 151 and will be allowed to continue with module FRK 181 immediately. This module entails computer applications for Accountancy and is presented during the full first semester (14 weeks). Should the student fail the exemption test, he or she can continue with FRK 151, which entails introductory computer-supported accountancy and a few lectures. The student who failed to pass the exemption test for FRK 151, will continue with FRK 181 in the second semester after having passed FRK 151 in the first semester.

NB :

- (i) ... *the Grade 12 examination*... refers to the final matriculation examination.
- (ii) 50% at higher grade is regarded to be equivalent to 60% at standard grade **for these purposes (only 1.2 (j))**. Applicants who matriculated before 1990 will be considered on merit.

A student who wishes to follow a course presented by another faculty, must familiarise himself with the admission requirements of the specific course, sub-minima in examinations, supplementary examinations, etc.

2. Registration for a particular year of study

At the beginning of an academic year, a student registers for all the courses he or she intends taking in that particular year (whether these be first-semester, second-

semester or year courses). Changes to the chosen course of study may be made at the beginning of the second semester with the Dean's approval.

The registration of a student will only be renewed if he passes at least half of the courses for which he registered initially, in a specific year of study. This also applies to the Science: Extended Programme.

2.1 **Science: Extended Programme (Renaissance) (02182001)**

- (a) This programme is followed by students, who as a result of exceptional circumstances, will benefit from an extended programme.
- (b) Students who wish to follow the Extended Programme will be subjected to a potential test and will be considered for admission by a Selection Committee.
- (c) Applications for admission to the Extended Programme should be submitted before 30 September each year. Details are obtainable from the Administration: Faculty of Science.
- (d) The rules and regulations applicable to the normal study programmes apply *mutatis mutandis* to the Science : Extended Programme, with exceptions as indicated in the regulations pertaining to the Science : Extended Programme.
- (e) Students admitted to the Extended Programme register for Science : Extended Programme.

3. **Examination and pass requirements**

A student must obtain a minimum semester/year mark of 40% for admission to the examination in a course, with the exception of first-semester courses on 100 level in which at least 30% is required. In addition, a student must comply with all departmental requirements as indicated in the syllabi. A subminimum of 40% is required in the examination of each course, except where a higher percentage is stipulated in the faculty regulations. Subminimum requirements in subdivisions of courses are indicated in the syllabi of each department. A student must obtain a final mark of at least 50% to pass in a course.

3.1 **Subminima in examinations**

Where applicable, the subminima required in examinations appear in the regulations of the degree in question and in the syllabi of the courses required for that degree.

3.2 **Examinations**

Examinations in first-semester courses, take place in May/June, while all other examinations (second-semester courses and year courses) take place in October/November.

- Credit in a course can only be obtained by passing the examination in that course.
- The relative weights of semester and examination marks in relation to the final mark are determined by the Head of the Department concerned in consultation with the lecturer(s). These weights are published in the Study Manual of the Faculty.

3.3 **Ancillary examinations**

After completion of an examination and before the examination results are published, the examiners may summon a student for an ancillary examination on particular aspects of the work of that course.

3.4 Re-marking of examination papers (also consult Reg G.14)

After an examination, departments give feedback to students about the framework that was used by the examiners during the examination. The way in which feedback is given, is determined by the departmental heads. Students may apply for re-marking of an examination paper within 14 calendar days of commencement of lectures in the next semester. The prescribed fee has to be paid. The paper will then be re-marked by an examiner appointed by the Head of the Department.

3.5 Supplementary examinations (also consult Gen. Reg. G.14)

- (a) Supplementary examinations in first-semester courses take place after the May/June examinations, while those in second-semester and year courses take place after the October/November examinations.
- (b) To pass a supplementary examination, a student must obtain a minimum of 50%.
- (c) The highest final percentage a student can obtain in a supplementary examination is 50%.

DEGREES AND DIPLOMAS CONFERRED/AWARDED IN THE FACULTY

The following degrees are awarded in the Faculty (minimum duration in brackets):

(a) General degrees

- (i) Baccalaureus Scientiae - BSc (3 years)
- (ii) Baccalaureus in Information Technology - BInformation Technology (4 years)
- (iii) Baccalaureus Scientiae Honores - BSc(Hons) (1 year)
- (iv) Magister Scientiae - MSc (1 year)
- (v) Magister in Information Technology - MInformation Technology (2 years)
- (vi) Baccalaureus Secundae Educationis (Scientiae) - BSecEd(Sci) (4 years)

(b) Degrees in Home Economics

- (i) Baccalaureus in Home Economics - BHomeEcon (4 years)
- (ii) Baccalaureus in Home Economics (Education) - BHomeEcon(Ed) (4 years)
- (iii) Baccalaureus Honores in Home Economics - BHomeEcon(Hons) (1 year)
- (iv) Magister in Home Economics - MHomeEcon (1 year)

(c) Doctoral degrees

- (i) Philosophiae Doctor - PhD (1 year)
- (ii) Doctor Scientiae - DSc

(d) Diplomas

- (i) Diploma in Education with specialisation in Science for the Secondary Phase - DipEd(Sci) (3 years)
- (ii) Further Diploma in Education (Computers and Telecommunication in Mathematics, Science and Technology Education) - FDE (2 years)
- (iii) Further Diploma in Education (Mathematics and Natural Sciences) – FDE (1 year full-time, 2 years telematic)
- (iv) Postgraduate Diploma in Earth Science Management and Practice - (2 years)
- (v) Postgraduate Diploma in Geographical Information Systems - P.Dip in GIS (1 year)
- (vi) Postgraduate Diploma in Environment and Society - (1 year)

BACHELOR OF SCIENCE DEGREES

GENERAL INFORMATION FOR BSc

General Regulations G.1 to G.15 apply to all bachelor's degrees.

(a) Admission requirements

(i) Baccalaureus Scientiae (BSc)

- *Study programmes in Earth, Chemical, Physical, Geo-Informatics and Environmental Sciences:*
A matriculation exemption certificate with at least 50% (D symbol) in Mathematics and Physical Science at higher grade.
- *Study programmes in Mathematical Sciences and Information Technology:*
A matriculation exemption certificate with at least 50% (D symbol) in Mathematics at higher grade.

NB: For the study programme in Computer Systems, 50% (D symbol) in Physical Science is an additional requirement.

(ii) Science: Extended Programme (Code 02182001)

- *Study programme In Earth, Chemical and Physical Sciences:*
A matriculation exemption certificate with at least 40% (E symbol) in Mathematics and Physical Science at higher grade or 50% (D symbol) at standard grade. (An admission test is required.)
- *Study programme in Mathematical Sciences and Information Technology:*
A matriculation exemption certificate with at least 40% (E symbol) in Mathematics at higher grade or 50% (D symbol) at standard grade. (A potential test is required.)

Admission requirements for specific courses appear in Par.1.2.

Subjects and courses

- (i) **Extended courses:** (For students who register for the BSc: Extended Programme.)

The following courses are available:

CMY 101	First course in Chemistry (equivalent course: CMY 131).	11 credits
CMY 102	General Chemistry (equivalent course: CMY 141)	11 credits
PHY 101	General Physics (equivalent course: PHY 131 and portion of PHY 171)	11 credits
PHY 102	Mechanics and Electricity (equivalent course: portion of PHY 171) (NB: Both PHY 101 and 102 must be passed for exemption from PHY 171 (year course))	11 credits
WTW 101	Introductory Mathematics 101 (equivalent course: WTW 114)	11 credits
WTW 102	Mathematics 102 (equivalent courses: WTW 126, 128)	11 credits

(ii) **Compulsory introductory courses for the Extended Programme**

CIL 171, CIL 172,

CIL 173 Computer and Information Literacy (2 credits each)

COS 160 Introductory Computer Science (6 credits)

NB: CIL 171, CIL 172, CIL 173 and COS 160 may not be taken if a student obtained a D-symbol at higher grade in Computer Studies in grade 12. If a student passed at standard grade, COS 160 may be taken.

SCI 152 Computer and Problem-solving Skills 152 (6 credits)

SCI 153 Academic Proficiency 153 (2 credits)

SCI 162 Computer and Problem-solving Skills 162 (6 credits)

SCI 163 Basic Research Skills 163 (2 credits)

Combinations not allowed: Students may not register for SCI 152 at the same time as CIL 171, CIL 172.

Students who complete SCI 152 successfully, are exempted from CIL 171 and CIL 172 and may register for COS 160.

EON 151 Basic Language Skills 151 (2 credits)

EON 152 Basic Language Skills 152 (2 credits)

EON 153 Basic Language Skills 153 (2 credits)

EON 154 Basic Language Skills 154 (2 credits)

A student is admitted to these courses only once.

Sc.1 Duration

The minimum duration of study is three years.

Sc.2 Study programmes

The BSc curriculum is compiled from one of the following study programmes or an alternative study programme as approved by the Dean:

Earth Sciences

Atmospheric Science:
 Meteorology
 Exploration Geophysics
 (consult Physical Sciences)
 Geography
 Geology
 Environmental and Engineering
 Geology

Physical Sciences

Exploration Geophysics
 Physics

Environmental Sciences

Information Technology

Information and Knowledge Systems
 Computer Systems
 Computer Science

Geo-Informatics

Mathematical Sciences

Computational Mathematics
 Applied Mathematics
 Financial Mathematics
 Mathematics
 Mathematical Statistics

Chemical Sciences

Chemistry
 Industrial Chemistry

Sc.3 Compilation of the curriculum

(i) The BSc curriculum may only be compiled within the framework of the study programmes set out in Sc. 7. The Dean may, however, approve an alternative

- study programme. A student indicates which programme he or she will follow after completion of the first academic year.
- (ii) A student must complete at least 225 course credits to comply with the requirements for the BSc degree. At least 56 credits must be obtained at 300/400 level. A maximum of 110 credits will be recognised at 100 level. A student may, in consultation with the Dean, take courses not referred to in Sc.4 and which are equivalent to a maximum of 22 credits.
 - (iii) A student may not register for more than 55 course credits in any semester, except with the permission of the Dean.
 - (iv) Students who hold a bachelor's degree, may not receive credit for courses passed for that degree at 300/400 level.

Sc.4 The courses for the BSc degree

The courses which may be followed for the BSc degree are indicated in the table below. The information in the table (as well as in the study programmes) are presented as follows:

- (aa) The columns contain: course code; course description; number of credits in brackets; prerequisite(s).
- (bb) The symbol GS next to a prerequisite indicates that a combined mark of at least 40% must be obtained. Alternatively a final mark of at least 40% is also acceptable.
- (cc) A course marked with the symbol †, indicates that the specific course must be passed before or be taken concurrently with the course in the first column.
- (dd) A comma and a semicolon must be interpreted as *and*, while the symbol / must be read as *or*.
- (ee) When no symbol or sign appears after a prerequisite the, course must be passed.
- (ff) *and/or TDH* next to a prerequisite indicates that permission from the Head of Department must be obtained, while *and/or TD* next to a prerequisite indicates that permission must be obtained from the Lecturer.
- (gg) When two or more courses are listed under prerequisites with only a comma between them, it signifies that all the courses have to be passed. If followed by a GS, it signifies that a GS has to be obtained in each of the subjects.

Code	Course Description	Credits	Prerequisites
Biochemistry			
BCM 216	Proteins and Enzymes 216	(6)	MLB 111GS; CMY 131,141GS/ 101, 102GS/112 122GS
BCM 217	Carbohydrate Metabolism 217	(6)	MLB 111GS; CMY 131,141GS/101, 102GS/112,122GS
BCM 218	Practical 218	(3)	BCM 216†,217†; CMY 283†,284†
BCM 226	Lipid and Nitrogen Metabolism 226	(6)	BCM 217GS
BCM 227	Biosynthesis of Macromolecules 227	(6)	BCM 217GS
BCM 228	Practical 228	(3)	BCM 216GS; BCM 226†, 227†
BCM 312	Protein Chemistry 312	(7)	BCM 216
BCM 321	Enzymology 321	(5)	BCM 216

BCM 322	Biomembranes 322	(5)	BCM 216,226
BCM 411	Molecular Biology of Nucleic Acids 411	(5)	BCM 216,227
BCM 423	Immunobiochemistry 423	(7)	BCM 216,227 (BCM 312, 411 recommended)

Students who take Biochemistry at third year level must, in addition to the courses in Biochemistry, also pass CMY 283 and 284.

Biology

MLB 111	Molecular and Cell Biology 111	(11)	
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Botany

BOT 120	Introductory Botany	(11)	MLB 111GS/TDH
BOT 213	Anatomy of Vascular Plants 213	(5)	BOT 120GS/TDH
BOT 227	Introductory Ecology 227	(2)	BOT 120GS/TDH
BOT 313	Reproductive Biology 313	(3)	CMY 141/102
BOT 320	Population Dynamics 320	(2)	BOT 120GS/TDH
BOT 323	Plant Systematics 323	(2)	BOT 120GS/TDH
BOT 324	Classification and Identification 324	(5)	BOT 120GS/TDH
BOT 325	Plant Community Ecology 325	(5)	BOT 120GS/TDH

Business Management

OBS 151,152	Business Management 151,152	(6)	
OBS 161,162	Business Management 161,162	(6)	OBS 151,152GS
OBS 251,252	Business Management 251, 252	(6)	OBS 151,152/161, 162 with a GS in the other; Par. 1.2
OBS 261,262	Business Management 261,262	(6)	OBS 151,152,161, 162 with a GS in the other; Par. 1.2
OBS 351,352	Business Management 351,352	(6)	OBS 151,152, 161, 162; OBS 251,252/ 261,262 with a GS in the other
OBS 361,362	Business Management 361,362	(6)	OBS 151,152,161, 162; any four of OBS 251,252,261, 262, OBS 351,352

Chemistry

CMY 101	First course in Chemistry 101	(11)	Par.1.2
CMY 102	General Chemistry	(11)	CMY 101GS/TDH
CMY 131	First course in Chemistry 131	(11)	Par. 1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS/ CMY 101
CMY 282	Physical Chemistry 282	(7)	CMY 131,141/ 101,102/TDH
CMY 283	Analytical Chemistry 283	(7)	CMY 131,141/101, 102/TDH
CMY 284	Organic Chemistry 284	(7)	CMY 131,141/101, 102/TDH

CMY 285	Inorganic Chemistry 285	(7)	CMY 131,141/101, 102/TDH
CMY 286	Polymer Chemistry 286	(7)	CMY 282,284
CMY 287	Environmental Chemistry 287	(7)	CMY 131,141/112, 122/101,102
CMY 380	Material Science 380	(7)	CMY282,283,284,285
CMY 382	Physical Chemistry 382	(7)	CMY 282
CMY 383	Analytical Chemistry 383	(7)	CMY 283
CMY 384	Organic Chemistry 384	(7)	CMY 284
CMY 385	Inorganic Chemistry 385	(7)	CMY 285
CMY 386	Chemical Process Technology 386	(7)	CMY 282
CMY 388	Chemometrics 388	(7)	CMY 282-5
CMY 389	Chemical Analysis 389	(7)	CMY 282,283,285
<i>For students following the Biological study programme as well as for Home Economics & Dietetics:</i>			
CMY 112	First course in Chemistry 112	(11)	Par.1.2
CMY 122	General Chemistry 122	(11)	Par.1.2

Computer Science

COS 110	Program Design: Introduction 110	(11)	Par.1.2
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 213	Advanced Programming 213	(7)	COS 110/TD
COS 221	Databases 221	(7)	COS 110/TD
COS 222	Operating Systems 222	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
COS 284	Computer Architecture 284	(7)	COS 110/TD
COS 301	Software Engineering 301	(7)	COS 212,222,283/TD
COS 314	Artificial Intelligence 314	(7)	COS 212,222,283/TD
COS 324	Concurrent and Distributive Systems 324	(7)	COS 212,222,283/TD
COS 332	Computer Networks 332	(7)	COS 212,222,283/TD
COS 333	Programming Languages 333	(7)	COS 212,222,283/TD
COS 341	Compiler Construction 341	(7)	COS 212,222,283/TD
COS 343	Trends in Information Technology 343	(7)	COS 212,222,283/TD

NB:

1. Students who comply with the matriculation requirements for COS 110 (Par.1.2) may not register for INF 151, CIL 171, 172, 173 and/or COS 160.
2. Students who are registered for COS 221 may not register for INF 251, 252; students registered for COS 222 may not register for INF 261, 262; students registered for COS 301 can not register for INF 351, 352, 353, 354 and 363.
3. Students must apply for readmission to any second-year course failed. Only a limited number of students can be accommodated.
4. Students must pass at least three Computer Science courses at second-year level, before admission to the Computer Science courses on third-year level will be permitted.
5. Students who passed COS 314 and 324 in 1996 or earlier, will only obtain (4) credits for each.

Economics

EKN 151, 152*	Economics 151,152	(6)	
EKN 120	Economics 120	(6)	EKN 151, 152GS

EKN 251,252*	Economics 251,252	(6)	EKN 151,152/120 with a GS in the other Par. 1.2
EKN 220*	Economics 220	(6)	EKN 151,152,120/251,252 with GS in other
EKN 351,352	Economics 351,352	(6)	EKN 151,152,120,220GS, Par.1.2
EKN 320	Economics 320	(6)	EKN 251,252,220/351, 352 with a GS in the other

* Course that can be promoted. Consult Reg. G. 27(iv) and Reg G. 10.3(c).

Environmental and Engineering Geology

GTX 311	Engineering Geology of SA 311	(4)	GLY 228
GTX 312	Soil Mechanics 312	(8)	GLY 228/TD
GTX 314	Environmental Hydrogeology 314	(4)	GLY 228/TD
GTX 321	Site Investigation 321	(5)	GLY 241, 243GS
GTX 324	Rock Mechanics 324	(5)	GLY 228/TD
GTX 325	Geological Environmental Management 325	(4)	GLY 228/TD

Exploration Geophysics

GPH 311	Numerical Methods 311	(9)	WTW 283
GPH 312	Gravitation/Magnetic Methods 312	(9)	PHY 171/101,102
GPH 321	Electrical/Radiometric Methods 321	(7)	PHY 221/226

Financial Accounting

FRK 151,152	Financial Accounting 151,152	(8)	Par. 1.2
FRK 161,162	Financial Accounting 161,162	(8)	FRK 151,152GS
FRK 251,252	Financial Accounting 251,252	(8)	FRK 151,152,161,162, Par 1.2
FRK 261,262	Financial Accounting 261,262	(8)	FRK 251,252GS; Par 1.2
FRK 351,352	Financial Accounting 351,352	(8)	FRK 251,252;261,262
FRK 361,362	Financial Accounting 361,362	(8)	FRK 351,352GS

Genetics

GTS 122	Introductory Genetics 122	(11)	MLB 111GS; Par 1.2
GTS 215	Molecular Genetics 215	(7)	MLB 111GS
GTS 217	Chemical and Analytical Meiosis 217	(7)	GTS 122GS
GTS 225	Microbial Genetics 225	(4)	MLB 111GS
GTS 226	Introductory Population Genetics 226	(6)	GTS 122GS
GTS 227	Cytogenetic Systems 227	(4)	GTS 217GS
GTS 314	Human Genetics 314	(7)	GTS 122GS
GTS 316	Plant Breeding 316	(7)	GTS 122GS
GTS 325	Eukaryotic Gene Control 325	(4)	GTS 215GS
GTS 326	Population Genetics 326	(4)	GTS 226GS
GTS 327	Cytotaxonomy 327	(6)	GTS 227GS

Geography

GGY 151	Society and space 151	(8)	Par.1.2
GGY 132	Cartographic Skills 132	(3)	Par.1.2
GGY 161	Physical Geography 161	(8)	Par.1.2
GGY 162	Remote Sensing 162	(3)	Par.1.2
GGY 251	Raster GIS 251	(7)	
GGY 252	Process Geomorphology 252	(7)	
GGY 261	Urban Geography 261	(8)	
GGY 262	Spatial Analysis 262	(6)	
GGY 351	Geography of Development 351	(8)	
GGY 352	Site Evaluation 352	(6)	TDH
GGY 361	Environmental Geomorphology 361	(7)	
GGY 362	Natural Resource Management 362	(7)	

Geology

GLY 181	Earth Systems 181	(6)	
GLY 151	Introductory Geology 151	(6)	Par.1.2
GLY 152	Physical Geology 152	(6)	Par.1.2
GLY 161	Historical Geology 161	(6)	Par.1.2
GLY 162	Environmental Geology 162	(6)	Par.1.2
GLY 214	Crystal Optics and Chemistry 251	(8)	GLY 112; CMY 131/101GS
GLY 215	Sedimentology 215	(8)	GLY 122,123
GLY 216	Structural Geology 216	(6)	GLY 122,123
GLY 243	Mapping 243	(6)	GLY 112,122
GLY 244	Mineralogy 244	(7)	GLY 214GS
GLY 245	Metamorphous Petrology 245	(7)	GLY 244GS
GLY 261	Igneous Petrology 261	(7)	GLY 244GS
GLY 263	SA Stratigraphic and Engineering Geology 263	(7)	TDH
GLY 264	Introduction to Geophysics 264	(7)	TDH
GLY 313	Igneous Petrology 313	(7)	GLY 213,214;224
GLY 319	Exploration Geochemistry 319	(7)	GLY 245,313GS CMY 131/101
GLY 323	Economic Geology 323	(14)	GLY 245, 313GS
GLY 381	Mapping Camp 381	(6)	GLY 243

Informatics

INF 153,154*	Informatics 153,154	(6)	Par.1.2
INF 163,164*	Informatics 163,164	(6)	
INF 253,263*	Informatics 253,263	(12)	INF 110,120, INF 153,154,163,164/ COS 110 and INF 153,154, 163, 164 or TDH; Par. 1.2

* Course that can be promoted. Consult Regulation C.28 (iv) in Rules and Syllabuses: Faculty of Economic and Management Sciences.

Mathematical Statistics

WST 151	Mathematical Statistics 151	(5½)	Par.1.2
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WST 152	Mathematical Statistics 152	(5½)	Par.1.2
WST 161	Mathematical Statistics 161	(4½)	WST 151,152GS
WST 162	Mathematical Statistics 16	(6½)	WST 151,152GS
WST 210	Mathematical Statistics 210	(14)	WST 151,152;161, 162,WTW114/101GS 126,128GS
WST 220	Mathematical Statistics 220	(14)	WST 210GS
WST 310	Mathematical Statistics 310	(14)	WST 210,220; WTW 211,218GS
WST 361	Mathematical Statistics 361	(7)	WST 210,220; WTW 211,218GS
WST 362	Mathematical Statistics 362	(7)	WST 210, 220; WTW 211,218GS

Mathematics and Applied Mathematics

WTW 114	Calculus 114	(11)	Par.1.2
WTW 115	Discrete Structures 115	(6)	Par.1.2
WTW 123	Numerical Analysis 123	(6)	WTW 114/101GS
WTW 126	Linear Algebra 126	(5)	WTW 114/101GS
WTW 128	Calculus 128	(6)	WTW 114/101GS
WTW 134*	Mathematics 134	(11)	Par.1.2
WTW 144*	Mathematics 144	(11)	WTW 134GS
WTW 152	Mathematical Modelling 152	(5)	Par.1.2
WTW 162	Mathematical Processes 162	(5)	WTW 114/101GS, WTW 152 GS
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 215**	Finite Mathematics 215	(7)	WTW114/101/ 134GS
WTW 218	Calculus 218	(7)	WTW 114/101,128
WTW 220*	Analysis 220	(7)	WTW 114/101,128
WTW 221	Linear Algebra 221	(7)	WTW 211
WTW 228*	Calculus 228	(7)	WTW 114/101,128
WTW 282	Dynamical Systems 282	(7)	WTW 114/101,286
WTW 283	Numerical Analysis 283	(7)	WTW 114/101, 123,128
WTW 285	Discrete Structures 285	(7)	WTW 115
WTW 286	Differential Equations 286	(7)	WTW 114/101, 126,128
WTW 289**	Geometry 289	(3)	WTW 114/101/134 GS
WTW 310	Analysis 310	(7)	WTW 220
WTW 312	Financial Mathematics 312	(7)	WTW 218
WTW 332	Stogastic Processes 332	(7)	WTW 126, 218
WTW 381	Algebra 381	(7)	WTW 114/101,211
WTW 383	Numerical Analysis 383	(7)	WTW 114/101, 128, 211
WTW 384	Complex Functions 384	(7)	WTW 220/228
WTW 385	Discrete Structures 385	(7)	WTW 126, 218, 285
WTW 386**	Partial Differential Equations 386	(7)	WTW 218, 282/286
WTW 389**	Geometry 389	(7)	WTW 211

NB:

STK 161,162 may not be presented with WTW 114/101, 126,128.

To be admitted to the examination in the courses WTW 114, WTW 126, WTW 128, WTW 211 and WTW 218, a student must perform satisfactorily in the technique mastering programme, in addition to the normal requirements for admission.

* WTW 114, 128 and 126 are for students who intend taking Mathematics at 200 level. WTW 134 and 144 do not generally lead to admission to Mathematics at 200 level and are intended for students who require Mathematics at 100 level only. In exceptional circumstances, however, students who have obtained exceptional marks in WTW 134 and 144 may be admitted to Mathematics at 200 level, with permission from the Head of the Department.
 WTW 114 may not be presented with WTW 134.
 WTW 126 and /or WTW 128 may not be presented with WTW 144.
 WTW 220 or WTW 228 may not be taken together.

** WTW 215, 289, 320, 386 and 389 will not necessarily be presented each year. Students must enquire about this at the Mathematics Department.

Meteorology

WKD 111	Atmospheric Processes 111	(5)	
WKD 112	Atmospheric Circulation 112	(5)	
WKD 121	Physical and Meso-scale Meteor. 121	(5)	
WKD 122	Dynamical & Numerical Meteor. 122	(5)	
WKD 123	Principles of Weather Prediction 123	(4)	
WKD 213	Introduction to Weather Forecasting 213	(5)	
WKD 214	Weather Forecasting Techniques 214	(5)	WKD 213GS
WKD 215	Community Project 215	(6)	
WKD 222	Physical Meteorology 222	(4)	WKD 121GS
WKD 223	Climate 223	(3)	
WKD 224	Marine Meteorology 224	(3)	
WKD 314	Dynamic Meteorology 314	(10)	WKD 222GS
WKD 324	Dynamic Meteorology 324	(8)	WKD 314GS
WKD 325	Cloud Dynamics 325	(3)	WKD 122GS
WKD 381	Research Project 381	(3)	TD

Microbiology

MBY 120	Introductory Microbiology 120	(11)	MLB 111GS; CMY 131/ 101GS; Par. 1.2
MBY 215	Taxonomy of Bacteria 215	(7)	MLB 111†; MBY 120 GS
MBY 221	Micro-Physiology 221	(9)	MLB 111;MBY 120 GS;BCM 216,217GS/ THD
MBY 226	Industrial Microbiology 226	(7)	MBY 120, BCM 216
MBY 311	Technology of Fungi 311	(2)	MBY 120/TDH
MBY 312	Taxonomy of Fungi 312	(9)	MBY 120/TDH
MBY 323	Molecular Microbiology 323	(7)	MLB 111; CMY 131, 141/101,102; MBY 120; BCM 216,217; 227 GS/TDH
MBY 324	Molecular Virology 324	(7)	Same as for MBY 323
MBY 414	Microbial Ecology 414	(4)	MLB 111; MBY 120 /TDH

Physics

PHY 113	Exploring the Universe 113	(6)	Par.1.2
SCI 121	Astronomy 121	(6)	Par.1.2
PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†/101†; 131†
PHY 216	General Physics 216	(17)	PHY 171/ 101, 102; FSK 116,126 WTW 114/10GS, WTW 211,128/ /218GS†
PHY 225	Classical Mechanics 225	(9)	PHY 216; WTW 220/ 218GS
PHY 226	Electromagnetism 226	(8)	PHY 216
PHY 316	Physics 316	(17)	PHY 225,226GS
PHY 317	Project 317	(9)	TDH
PHY 327	Physics Project 327	(9)	TDH
PHY 329	Applied & Statistical Physics 329	(17)	PHY 225,226GS

For students taking a Biological study programme :

PHY 131	General Physics 131	(11)	Par.1.2
PHY 181	General Physics 181	(22)	Par.1.2

NB: PHY 131 is the same as the first semester of PHY 181 and is meant for students who only need to take Physics for one semester. Both courses cannot be presented for credits.

Subminima: For admission to the examination in all courses in Physics, a sub-minimum of 40% is required.

Students without an adequate background in Mathematics and/or Physical Science are advised to register for computer-assisted instruction at the Gold Fields Computer Centre.

Psychology

SLK 151	Psychological Perspectives 151	(3)	
SLK 152	Cognitive Processes 152	(3)	
SLK 153	Social Psychology I 153	(3)	
SLK 156	Developmental Systems Theory 156	(3)	
SLK 251	Personology 251	(3)	SLK 151,152,153,156
SLK 254	Social Psychology II 254	(3)	SLK 151,152,153,156
SLK 255	Perspectives on the Family 255	(3)	SLK 151,152,153,156
SLK 256	Psychological Assessment I 256	(3)	SLK 151,152,153,156
SLK 351	Community Psychology I 351	(3)	SLK 251, 254, 255, 256
SLK 352	Abnormal Behaviour 352	(3)	SLK 251,254,255,256
SLK 353	Critical Perspectives 353	(3)	SLK 251,254,255,256
SLK 354	Community Psychology in Practice 354	(3)	SLK 251,254,255,256

Soil Science

GKD 213	Introductory Soil Science 213	(9)	CMY 131,141GS/ 101,102GS/TDH
GKD 228	Soil Fertility 228	(9)	GKD 213GS
GKD 317	Soil Classification and Mapping 317	(7)	GKD 213GS

GKD 318	Soil Chemistry 318	(7)	GKD 213
GKD 329	Soil Physics 329	(9)	GKD 213
GKD 415	Soil Mineralogy and Genesis 415	(7)	GKD 213; GKD 317

Zoology and Entomology

ZEN 122	Introductory Zoology 122	(11)	MLB 111GS
ZEN 210	Development and Morphology 210	(7)	TDH
ZEN 211	Invertebrate Morphology 211	(7)	TDH
ZEN 220	Animal Physiology 220	(7)	TDH
ZEN 221	Mammalogy 221	(7)	TDH
ZEN 222	Insect Diversity 222	(7)	TDH
ZEN 310	Ecology 310	(7)	TDH
ZEN 311	Ecophysiology 311	(7)	TDH
ZEN 320	Insect Pest Control 320	(7)	TDH
ZEN 321	South African Insect Pests 321	(7)	TDH

(i) **Other Courses**

ERR 220	Computers 220	(8)	
ERR 320	Computers 320	(8)	ERR 220
FIL 182	Science and World Views 182	(2)	

Only students doing the Financial Mathematics Programme will receive credit for:

Banking

BKW 251, 252	Banking 251, 252	(6)	EKN 120; Par. 1.2
BKW 220	Banking 220	(6)	EKN 251, 252, BKW 251,252GS/ FBS 210GS
BKW 351, 352	Banking 351, 352	(6)	BKW 220GS
BKW 361, 362	Banking 361, 362	(6)	BKW 251,252, 351,352GS

Financial Management

FBS 252	Financial Management 252	(6)	WTW 128, FRK 151/ 152GS, FRK 161,162
FBS 361	Financial Management 361	(6)	FBS 252, FRK 151/ 152GS, FRK 161,162

(ii) **Courses for BSecEd(Sci) and DipEd(Sci)**

SCE 170	Religious Instruction 170	(4)	-
SCE 200	Science Education 200	(10)	-
SCE 300	Science Education 300	(16)	SCE 200 and one subject didactics
SCE 301	Educational Community Project 301	(10)	SCE 200 and one subject didactics
SCE 302	School Practice 302	(22)	SCE 200 and one subject didactics
SCE 400	Science Education 3	(16)	SCE 300
SCE 402	School Practice 402	(10)	Two school subjects at 200 level and two subject didactics

SCE 471	Subject Didactics of Biology 471	(14)	BLG 150,160 or MLB 111 and ZEN 122 or BOT 120
SCE 472	Subject Didactics of Geography 472	(14)	GGY 151,132, GGY 161,162
SCE 473	Subject Didactics of Agriculture 473	(14)	AGC 150,160
SCE 474	Subject Didactics of Physical Science 474	(14)	PHY 171; CMY 131,141
SCE 475	Subject Didactics of Computer Studies 475	(14)	COS 110,212,283
SCE 476	Subject Didactics of Mathematics 476	(14)	WTW 114/101,126, 128
TED 400	Language Endorsement		

(iii) **Courses for the Further Diploma in Education**

RTS 410	Computer aided testing 410	(4)
SEF 481	Tendencies in Maths-, Science & Technology Education 481	(4)
SEF 482	Computers in Maths-, Science & Technology Education 482	(4)
SEF 483	Computers in Maths, Science & Technology Education 483	(4)
SEF 484	Computer: Laboratory and Class Aid	(4)
SEF 485	Network software and hardware	(4)

Sc.5 Special examination

A student who requires a maximum of 28 credits to comply with degree requirements, may be permitted by the Dean, on the recommendation of the Head/s of the Department/s concerned, to a special examination in the courses which he or she has failed, to enable them to comply with all the requirements for the degree. A student who has obtained a final mark of less than 40% in any one of the courses concerned, or who was previously admitted to a special examination, does not qualify for this examination.

Sc.6 Degree with distinction

A student obtains the degree with distinction if he or she passes all the prescribed courses at 300 level or higher in one academic year with a weighted average of at least 75% in those courses, provided that a sub-minimum of 65% is required.

Sc.7 STUDY PROGRAMME FOR THE BSC DEGREE

The curricula are compiled from one of the following study programmes. Subjects courses as required by the Faculty, general field of study and departments have to be passed. The Dean may approve a different study programme.

Sc.7.1 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN EARTH SCIENCES

General Information

- (i) A subminima of 40% is required in both theory and practical work for admission to examination, except GGY 151, 132, GLY 151, 152, for which the subminima is 30%.

- (ii) The attendance of excursions for first-year students is compulsory, while excursions of longer duration are compulsory for senior students.
- (iii) Knowledge of certain sources may be a prerequisite for certain course.
- (iv) For the BSc(Hons) course specialising in Geology, Exploration Geophysics and Engineering Geology – Consult the Head of the Department.
- (v) **Modules:** Two predominantly parallel modules are offered only in the first semester of the first year of study. In all the other years of study, modules will succeed one another in blocks.

(a) Study Programme in Geography (Code 02133011)

This career direction entails the study of the relations and interdependencies between humans and their environment, environmental problems which confront people, as well as the processes which underlie these problems, in order to contribute towards the solving of environmental problems and to improve the life quality of people. Potential employers include the civil service, provincial and local authorities, the HSRC, CSIR, Africa Institute of South Africa, universities, building societies, banks, property developers, tourism and nature conservation organisations and architectural firms. Should geography be combined with subjects such as mathematics and botany, a career in education is another possibility.

Faculty Requirements (11)

WTW 114 or	Calculus 114 or	(11)	Par.1.2
WTW 134	Mathematics 134	(11)	Par.1.2

General Requirements for Earth Sciences (22)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS

Compulsory Courses (109)

GGY 151	Community and Space 151	(8)	Par.1.2
GGY 132	Cartographic Skills 132	(3)	Par.1.2
GGY 161	Physical Geography 161	(8)	Par.1.2
GGY 162	Remote Sensing 162	(3)	Par.1.2
BOT 120	Introductory Botany 120	(11)	MLB 111GS/TDH
MLB 111	Molecular and Cell Biology	(11)	Par.1.2
GGY 251	Raster GIS 251	(7)	
GGY 252	Process Geomorphology 252	(7)	
GGY 261	Urban Geography 261	(8)	
GGY 262	Spatial Analysis 262	(6)	
GKD 213	Introductory Soil Science 213	(9)	CMY131,141GS/ TDH
GGY 351	Geography of Development 351	(8)	
GGY 352	Site Evaluation 352	(6)	
GGY 361	Environmental Geomorphology 361	(7)	
GGY 362	Natural Resource Management 362	(7)	

Limited Choice (82)

82 credits chosen from the following disciplines:

Zoology and Entomology	Soil Science	Computer Science	Geology
Mathematical Statistics	Botany	Meteorology	

Outstanding Credits (1)

(b) Study Programme n Geology (Code 02133021)

The geologist is an expert in the field of materials from which earth is composed, the processes that influence these and the products which is thus formed. Geologists typically work for mining houses. Organisations such as the Council for Geoscience, MINTEK, SASAL, SOEKOR, ESCOM and the CSIR, as well as local authorities, universities, technikons and museum also employ geologists. Geologists can also establish private consulting firms, or join an existing one.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Earth Sciences Requirement (22)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS

Compulsory Courses (139)

GLY 151	Introduction to Geology 151	(6)	Par. 1.2
GLY 152	Physical Geology 152	(5)	Par. 1.2
GLY 161	Historical Geology 161	(6)	Par. 1.2
GLY 162	Environmental Geology 162	(5)	Par. 1.2
CIL 171,172	Computer and Information		
173	Literacy	(6)	Par. 1.2
GLY 214	Crystal Optics and Chemistry 214	(8)	GLY 112;CMY131GS
GLY 215	Sedimentology 215	(8)	GLY 122,123
GLY 216	Structural Geology 216	(6)	GLY 122,123
GLY 243	Mapping 243	(6)	GLY 112,122
GLY 244	Mineralogy 244	(7)	GLY 214GS
GLY 245	Metamorphic Petrology 245	(7)	GLY 244GS
GLY 261	Igneous Petrology 261	(7)	GLY 244GS
GLY 263	S.A. Stratigraphy and		
	Engineering geology 263	(7)	TDH
GLY 264	Introduction to Geophysics 264	(7)	TDH
CMY 285 or	Inorganic Chemistry 285 or	(7)	CMY 131,141/TDH
CMY 287	Environmental Chemistry 287	(7)	CMY 131,141/TDH
CMY 283	Analytical Chemistry 283	(7)	CMY 131,141/TDH
GLY 313	Igneous Petrology 313	(7)	GLY 213,214,244
GLY 319	Exploration Geochemistry	(7)	GLY 245,313GS
			CMY 131
GLY 323	Economic Geology 323	(14)	GLY 245,313GS/TDH
GLY 381	Mapping Camp 381	(6)	GLY 243

Outstanding Credits (53)

A choice from the following course is recommended:

PHY 171, WKD 111, WKD 112, WKD 121, WKD 122, WTW 126, WTW 128.

(c) Study Programme in Environmental and Engineering Geology (Code 02133040)

The environmental and engineering geologist studies the interaction between human activities and the geological environment in order to recognise those geological factors which can influence the human environment. Thus, timeous intervention can take place to safeguard people or prevent geological catastrophes, such as earthquakes, landslides, floods and sinkholes. Degradation of the natural environment can also be halted or restored.

Job opportunities are offered by consulting engineering contractors, mining companies and statutory councils, such as the Geological Survey and the CSIR. It is also possible to establish a private firm, or join an existing one.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Earth Sciences Requirement (22)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS

Compulsory Courses (180)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
GLY 151	Introduction to Geology 151	(6)	Par. 1.2
GLY 152	Physical Geology 152	(5)	Par. 1.2
GLY 161	Historical Geology 161	(6)	Par. 1.2
GLY 162	Environmental Geology 162	(5)	Par. 1.2
CIL 171,172, 173	Computer and Information Literacy	(6)	Par.1.2
GLY 214	Crystal Optics and Chemistry 214	(8)	GLY112;CMY 131GS
GLY 215	Sedimentology 215	(8)	GLY 122,123
GLY 216	Structural Geology 216	(6)	GLY 122,123
GLY 243	Mapping 243	(6)	GLY 112, 122
GLY 244	Mineralogy 244	(7)	GLY 112, 122
GLY 245	Metamorphic Petrology 245	(7)	GLY 244GS
GLY 261	Igneous Petrology 261	(7)	GLY 244GS
GLY 263	S.A. Stratigraphic and Engineering geology 263	(7)	TDH
GLY 264	Introduction to Geophysics 264	(7)	TDH
CMY 285 or CMY 287	Inorganic Chemistry 285 or Environmental Chemistry 287	(7)	CMY 131, 141/TDH
CMY 283	Analytical Chemistry 283	(7)	CMY 131,141/TDH
GLY 313	Igneous Petrology 313	(7)	GLY 213,214,244
GLY 319	Exploration Geochemistry 319	(7)	GLY 245,313GS, CMY 131
GLY 323	Economic Geology 323	(14)	GLY 245,313GS/TDH
GLY 381	Mapping Camp 381	(6)	GLY 243
GTX 311	Engineering Geology of SA 311	(4)	GLY 228
GTX 312	Soil Mechanics 312	(8)	GLY 228/TD
GTX 314	Environmental Hydrogeology 314	(4)	GLY 228/TD
GTX 321	Site Investigation 321	(5)	GLY 241,243GS
GTX 324	Rock Mechanics 324	(5)	GLY 228/TD

GTX 325 Geological Environmental Management 325 (4) GLY 228/TD

Outstanding Credits (12)

A choice from the following courses at first-year level is recommended
 PHY 171, WKD 111, WKD 112, WKD 121, WKD 122, WTW 126, WTW 128.

(d) Study Programme in Atmospheric Science: Meteorology (Code 02133311)

The atmospheric scientist studies the behaviour, composition and processes of the atmosphere in order to predict weather and climatic occurrences, thus enabling people to improve their standard of life. Job opportunities are offered by the South African Weather Bureau, the CSIR, ESCOM, universities, agricultural organisations and industries.

Faculty Requirement (11)

WTW 114 Calculus 114 (11) Par.1.2

General Atmospheric Science Requirements (22)

PHY 171 First course in Physics 171 (22) Par.1.2;
 WTW 114†

Compulsory Courses (109)

WKD 111	Atmospheric Processes 111	(5)	
WKD 112	Atmospheric Circulation 112	(5)	
WKD 121	Physical and Meso-scale Meteor. 121	(5)	
WKD 122	Dynamical and Numerical Meteor. 122	(5)	
WKD 123	Weather Forecasting Principles. 123	(4)	
WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WKD 213	Introduction to Weather Forecasting 213	(5)	
WKD 214	Weather Forecasting Techniques 214	(5)	WKD 213GS
WKD 215	Community Project 215	(6)	
WKD 222	Physical Meteorology 222	(4)	WKD 121GS
WKD 223	Climate 223	(3)	
WKD 224	Marine Meteorology 224	(3)	
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 218	Calculus 218	(7)	WTW 114, 128
WTW 228	Calculus 228	(7)	WTW 114, 128
WKD 314	Dynamic Meteorology 314	(10)	WKD 222GS
WKD 324	Dynamic Meteorology 324	(8)	WKD 314GS
WKD 325	Cloud Dynamics 325	(3)	WKD 122GS
WKD 381	Research Project	(6)	

Outstanding Credits: At least (83) selected from the following disciplines:

Applied Mathematics	Mathematical Statistics	Mathematics
Geology	Chemistry	Physics
Computer Science	Geography	Soil Science

The courses WTW 112, 122 and WTW 123 are recommended.

Sc.7.2 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN ENVIRONMENTAL SCIENCES

Study Programme in Environmental Science (Code 02133361)

This study programme caters for the great demand for environmental scientists. The environmental scientist studies the processes, relations and interdependencies within the natural environment, and the impact of people on all of this. Great emphasis is placed on the management and monitoring of the environment. Potential employers include government departments, provincial and local authorities, the CSIR, universities, nature conservation bodies, environmental consultants and engineering contractors.

Faculty Requirement (11)

WTW 114 or	Calculus 114 or	(11)	Par.1.2
WTW 134	Mathematics 134	(11)	Par.1.2

General Environmental Sciences Requirements (105)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS
MLB 111	Molecular and Cell Biology 111	(11)	
ZEN 122	Introductory Zoology 122	(11)	MLB 111GS
BOT 120	Introductory Botany 120	(11)	MLB 111/TDH
GGY 151	Community and Space 151	(8)	Par.1.2
GGY 161	Physical Geography 161	(8)	Par.1.2
GGY 251	Raster GIS 251	(7)	
GGY 252	Process Geomorphology 252	(7)	
GGY 352	Site Evaluation 352	(6)	
GGY 361	Environmental Geomorphology 361	(7)	
GGY 362	Natural Resource Management 362	(7)	

Restricted Choice (at least 36 credits)

At least 36 credits at 300/400 level from the following disciplines:

Archaeology	Physics	Computer Science
Economics	Geography	Botany
Chemistry	Geology	Mathematical Statistics
Soil Science	Meteorology	Zoology & Entomology

Outstanding Credits (73)

Please take note of the prerequisites for some courses and disciplines.

The 22 credits allowed with regards to courses not listed in Sc 4., may only be increased to a maximum of 40 if Archaeology is taken as a course.

Sc.7.3 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN CHEMICAL SCIENCES

To be admitted to the examination in the first semester in a course at 100 level, a student must obtain at least 30% in the theory and at least 30% in the practical

sections of Chemistry. To be admitted to the examination in all other courses in Chemistry, a student must obtain at least 40% in the theory and at least 40% in the practical sections of Chemistry.

(a) Study Programme in Chemistry (Code 02133171)

The study programme in Chemistry is based on the fundamental aspects of the discipline, and offers the opportunity to combine chemistry with other fields, such as physics, geology, mathematics, computer sciences, or subject in the biological sciences.

The successful completion of this degree course enables the student to study further at postgraduate level and obtain a MSc or PhD degree, or to enter the chemistry profession directly. If chemistry is the main subject, the industry prefers that an honours degree should also be completed.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Chemistry Requirements (55)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS
WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†

Compulsory Courses (56)

CMY 282	Physical Chemistry 282	(7)	CMY 131,141/TDH
CMY 283	Analytical Chemistry 283	(7)	CMY 131,141/TDH
CMY 284	Organic Chemistry 284	(7)	CMY 131,141/ TDH
CMY 285	Inorganic Chemistry 285	(7)	CMY 131,141/TDH
CMY 382	Physical Chemistry 382	(7)	CMY 282
CMY 383	Analytical Chemistry 383	(7)	CMY 283
CMY 384	Organic Chemistry 384	(7)	CMY 284
CMY 385	Inorganic Chemistry 385	(7)	CMY 285

Outstanding Credits (103)

(b) Study Programme in Industrial Chemistry (Code 02133181)

This study programme prepares the student for a career that includes process control, development of techniques and new chemical products, as well as financial planning, management and consultation in the chemistry industry. Students are also given the skills to open their own chemistry firm and to create jobs for other people.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Chemistry Requirements (55)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
CMY 141	General Chemistry 141	(11)	CMY 131GS

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†

Compulsory Courses (125 to 140)

COS 160* or	Computer Science 160 or	(6)	Par.1.2
COS 110**	Programme Design 110	(11)	
GLY 112 or	Earth Materials 112 or	(6)	
GMI 210	Mineralogy 210	(8)	
FRK 151,152 or	Financial Accounting 151,152 or	(8)	Par.1.2
OBS 151,152	Business Management 151,152	(6)	
CIR 121	Chemical Engineering 121	(8)	
CIR 212	Chemical Engineering 212	(7)	CIR 121GS
CMY 282	Physical Chemistry 282	(7)	CMY 131,141/TDH
CMY 283	Analytical Chemistry 283	(7)	CMY 131,141/TDH
CMY 284	Organic Chemistry 284	(7)	CMY 131,141/ TDH
CMY 285	Inorganic Chemistry 285	(7)	CMY 131,141/TDH
CMY 286	Polymer Chemistry 286	(7)	CMY 282,284
CMY 287	Environmental Chemistry 287	(7)	CMY 131,141/TDH
CMY 380	Material Science 380	(7)	CMY 282,283,284, 285
CMY 382	Physical Chemistry 382	(7)	CMY 282
CMY 383	Analytical Chemistry 383	(7)	CMY 283
CMY 384	Organic Chemistry 384	(7)	CMY 284
CMY 385	Inorganic Chemistry 385	(7)	CMY 285
CMY 386	Chemical Process Technology 386	(7)	CMY 282
CMY 388	Chemometrics 388	(7)	CMY 282,283,284, 285
CMY 389	Chemical Analysis 389	(7)	CMY 282,283,285

Outstanding Credits (34 to 19)

A student who has passed the grade 12 examination

* in Computer Studies with at least 50% (D symbol) at higher grade;

** in Computer Studies with at least 50% (D) at higher grade, or 60% at standard grade, take the alternative course.

Students who intend studying for a BSc(Hons) degree specialising in Chemistry, must pass the courses CMY 382 – 385.

Sc.7.4 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN PHYSICAL SCIENCES

(a) Study Programme in Exploration Geophysics (Code 02133191)

The exploration geophysicist combines geological knowledge with knowledge of physics, mathematics and computer science in the search for natural resources. The work includes among other things the pinpointing of places to sink boreholes for the

utilisation of groundwater, the demarcation of new minerals for mining and industry, and the search for oil field.

He or she can also become involved with engineering projects, such as investigation of foundations at dam construction sites, and the mapping of ground water pollution sites.

Geophysicists work for national and international mining and oil companies, engineering firms, government and statutory bodies, and universities. Excellent opportunities also exist for the geophysical entrepreneur to establish his or her own consulting firm, or join an existing one.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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Compulsory Courses (191)

CMY 131	First course in Chemistry 131	(11)	Par.1.2
GLY 151	Introduction to Geology 151	(6)	Par. 1.2
GLY 152	Physical Geology 152	(5)	Par. 1.2
GLY 161	Historical Geology 161	(6)	Par. 1.2
GLY 162	Environmental geology 162	(5)	Par. 1.2
GLY 215	Sedimentology 215	(8)	GLY 122,123
GLY 216	Structural Geology 216	(6)	GLY 122,123
GLY 243	Mapping 243	(6)	GLY 112,122
GLY 263	S.A. Stratigraphic and Engineering geology 263	(7)	TDH
GLY 264	Introduction to Geophysics 264	(7)	TDH
GLY 323	Economic Geology 323	(14)	GLY 313,316GS/TDH
WTW 123	Numerical Analysis 123	(6)	WTW 114GS
WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 218	Calculus 218	(7)	WTW 114, 128
WTW 283	Numerical Analysis 283	(7)	WTW 114,123,128
PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†
PHY 216	General Physics 216	(17)	PHY171/FSK116, 126 WTW 211/218GS†
PHY 226	Electromagnetism 226	(8)	PHY 216
GPH 311	Numerical Methods 311	(9)	WTW 283
GPH 312	Gravitation/Magnetic Methods 312	(9)	PHY 171
GPH 321	Electrical/Radiometric Methods 321	(7)	PHY 216/226

Outstanding Credits (23)

(b) Study Programme in Physics (Code 02133201)

The Physicist is innovative and creative and is equipped through training with the necessary skills to make relevant observation, to be able to analyse and arrange these, so that answers to real problems can be sought. Physicists are mostly research workers who analyse nature and its composition, but can just as easily find a place in managing positions as a result of their training.

Physicists are employed by organisations such as ESCOM, ELOPTRO, MINTEK, SASOL, ISCOR, the AEC, SABS, CSIR, universities, hospitals and various industries.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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Compulsory Courses (129)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†
PHY 216	General Physics 216	(17)	PHY 171/FSK 116, 126 WTW 211/218GS
PHY 225	Classical Mechanics 225	(9)	PHY 216; WTW 220/ 228GS
PHY 226	Electromagnetism 226	(8)	PHY 216
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 221	Linear Algebra 221	(7)	WTW 211
WTW 220 or	Analysis 220 or	(7)	WTW 114, 128
WTW 228	Calculus	(7)	WTW 114,128
PHY 316	Physics 316	(17)	PHY 225,226GS
PHY 329	Applied and Statistical Physics 329	(17)	PHY 225,226GS

Outstanding Credits (85)

Sc.7.5 STUDY PROGRAMME IN GEO-INFORMATION SCIENCES

Baccalaureus Scientiae with specialisation in Geo-informatics (Code 02133383)

One of the most important functions of humans on earth, is to manage the natural and the man-made environment. Good management will ensure that the limited resources are used optimally for sustained development. To achieve this, timely and accurate information, especially geographical information, regarding the environment is required. Geographical information includes every single detail concerning a certain spot – on, under and above the surface of the earth.

Geo-informatics is the field of knowledge which supplies geographic information. This process entails surveying, processing of satellite images, aerial photography, information systems technology, as well as mapping and visualisation. The student is equipped with the knowledge and skills to understand the environment in the first place, and secondly to be able to supply the necessary geographic information to all parties concerned with the environment.

A growing need exists for this expertise, and employment opportunities exist at most of the government departments, city and town councils, and organisation such as Eskom, Telkom, the CSIR, HRC, as well as at private undertakings as consultants, at financial institutions, etc. The programme provides for a number of specialisation

fields and some subject choices can serve as preparatory studies for professional registration as Surveyors, GIS Practitioners, etc.

Faculty requirements (11)

WTW 114 Calculus 114 (11) Par 1.2

General Geo-informatics core modules (95 or 103)

WST 151 Mathematical Statistics 151 (5½) Par 1.2
 WST 152 Mathematical Statistics 152 (5½) Par 1.2
 WST 161 Mathematical Statistics 161 (4½) WST 151,152GS
 WST 162 Mathematical Statistics 162 (6½) WST 151,152GS
 GGY 161 Physical Geography 161 (6) Par 1.2
 GGY 132 Cartographic Skills 132 (3) Par 1.2
 GMC 110 Cartography 110 (6) Par 1.2
 GGY 162 Remote sensing 162 (3) Par 1.2
 GGY 251 Introduction to GIS 251 (7) WTW 114GS
 SUR 220 Surveying 220 (9) WTW 114GS
 TRN 213 Site survey 213 (6) WTW 114GS
 GMT 320 Geo-informatics project 320 (9) TDH

One of the following groups:

INF 151 Informatics 151 (4) Par.1.2
 INF 152 Informatics 152 (4) INF 151
 INF 251,252 Informatics 251,252 (8) INF 152
 INF 261,262 Informatics 261,262 (8) INF 152

or

COS110 Program design 110 (11) Par.1.2
 COS221 Data bases 221 (7) COS 110/TD
 COS222 Operating Systems 222 (7) COS 110/TD
 COS283 Systems Integration 283 (7) COS 110/TD

Optional modules according to field of specialisation (119 or 111) with a minimum of 56 at 300 level

WTW 126 Linear Algebra 126 (5) WTW 114GS
 WTW 128 Calculus 128 (6) WTW 114GS
 WST 210 Mathematical Statistics 210 (14) WST 152,152; 161, 162, WTW 114/101, 126, 128
 WST 220 Mathematical Statistics 220 (14) WST 210GS
 PHY 131 General Physics 131 (11) Par 1.2
 GGY151 Society and Space 151 (8) Par 1.2
 GMA 220 Remote Sensing and GPS 220 (9) Par 1.2
 GMA 310 Remote Sensing 310 (9) COS 212, 221/INF 251,252,261,262; WST 220; GMA 220 GS
 GMA 320 Remote Sensing 320 (9) COS 212, 221/ INF251,252,261,262; WST 220; GMA 220 GS
 GMC 210 Cartography 210 (9) WTW 126,128GS

GMC 310	Cartography 310	(9)	COS 212, 221/ INF251,252,261,262; GMC210 GS
GMC 320	Cartography 320	(9)	COS 212, 221/ INF251,252,261,262; GMC 310GS
SUR 220	Surveying 220	(9)	WTW 114GS
SUR 320	Surveying 320	(9)	WST210,220; TRN 213;SUR 220;ABK 310
ABK 310	Geodesie 310	(9)	WTW 126,128GS
GIS 210	Geographic Data Analysis 210	(9)	
GIS 310	Geographic Information Systems 310	(9)	
GIS 320	Spatial Analysis 320	(9)	
INF153,154	Informatics 153,154	(6)	Par 1.2
INF 163,164	Informatics 163,164	(6)	Par 1.2
INF270	Informatics 270	(12)	INF151, 152/153– 164/TDH, Par 1.2

Outstanding credits from subjects listed under Sc.4, unless permission has been obtained from the Dean in advance.

Sc.7.6 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN INFORMATION TECHNOLOGY
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(a) Study Programme in Information and Knowledge Systems (Code 02133211)

This study programme, and in particular the main subject Computer Science, equips the student with the necessary skills to produce software of good quality. Technical areas such as computer systems and networks and programming languages are studied.

As specialist in the field of information and knowledge systems, this person will work as a member of a team of computer specialists in a big organisation, especially in the field of commerce.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Information Technology Requirements (88)

COS 110	Program Design: Introduction 110	(11)	Par.1.2
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 213	Advanced Programming 213	(7)	COS 110/TD
COS 221	Databases 221	(7)	COS 110/TD
COS 222	Operating Systems 222	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
COS 284	Computer Architecture 284	(7)	COS 110/TD
COS 301	Software Engineering 301	(7)	COS 212,222,283/TD

At least 4 of the following courses:

COS 314	Artificial Intelligence 314	(7)	COS 212,222,283/TD
COS 324	Concurrent and Distributive Systems 324	(7)	COS 212,222,283/TD
COS 332	Computer Networks 332	(7)	COS 212,222,283/TD
COS 333	Programming Languages 333	(7)	COS 212,222,283/TD
COS 341	Compiler Construction 341	(7)	COS 212,222,283/TD
COS 343	Trends in Information Technology 343	(7)	COS 212,222,283/TD

Compulsory Courses (24)

INF 153,154	Informatics 153,154	(6)	Par.1.2
INF 163,164	Informatics 163,164	(6)	Par.1.2
INF 253,263	Informatics 253,263	(12)	INF 151,152,153–164/TDH or COS 110, Par. 1.2

Outstanding Credits (102)

(b) Study Programme in Computer Systems (Code 02133221)

NB. Students must obtain at least 50% (D Symbol) in both Mathematics and Physical Science at higher grade in the matriculation examination for admission to this programme.

As specialist in the field of computer systems, this person will probably be responsible for programme development in the technical, scientific and engineering field. This person's expertise lies in the field of the functioning of various electronic components of a computer.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Information Technology Requirements (88)

COS 110	Program Design: Introduction 110	(11)	Par.1.2
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 213	Advanced Programming 213	(7)	COS 110/TD
COS 221	Databases 221	(7)	COS 110/TD
COS 222	Operating Systems 222	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
COS 284	Computer Architecture 284	(7)	COS 110/TD
COS 301	Software Engineering 301	(7)	COS 212,222,283/TD

At least 4 of the following courses:

COS 314	Artificial Intelligence 314	(7)	COS 212,222,283/TD
COS 324	Concurrent and Distributive Systems 324	(7)	COS 212,222,283/TD
COS 332	Computer Networks 332	(7)	COS 212,222,283/TD
COS 333	Programming Languages 333	(7)	COS 212,222,283/TD
COS 341	Compiler Construction 341	(7)	COS 212,222,283/TD
COS 343	Trends in Information Technology 343	(7)	COS 212,222,283/TD

Compulsory Courses (38)

PHY 171	First course in Physics 171	(22)	Par.1.2; WTW 114†
ERS 220	Computers 220	(8)	
ERS 320	Computers 320	(8)	ERS 220

Outstanding Credits (88)

(c) Study Programme in Computer Science (Code 02133231)

The computer scientist is knowledgeable in the field of the fundamental mathematical principles on which computer science, or the science of computing, is based. As such, the person usually works as information technologist, and continues with postgraduate studies and research work.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Information Technology Requirements (88)

COS 110	Program Design: Introduction 110	(11)	Par.1.2
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 213	Advanced Programming 213	(7)	COS 110/TD
COS 221	Databases 221	(7)	COS 110/TD
COS 222	Operating Systems 222	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
COS 284	Computer Architecture 284	(7)	COS 110/TD
COS 301	Software Engineering 301	(7)	COS 212,222,283/TD
<i>At least 4 of the following courses:</i>			
COS 314	Artificial Intelligence 314	(7)	COS 212,222,283/TD
COS 324	Concurrent and Distributive Systems 324	(7)	COS 212,222,283/TD
COS 332	Computer Networks 332	(7)	COS 212,222,283/TD
COS 333	Programming Languages 333	(7)	COS 212,222,283/TD
COS 341	Compiler Construction 341	(7)	COS 212,222,283/TD
COS 343	Trends in Information Technology 343	(7)	COS 212,222,283/TD

NB: Students who completed COS 314 and COS 324 in 1996 or earlier, will only obtain (4) credits for each.

Compulsory Courses (38)

WTW 115	Discrete Structures 115	(6)	Par.1.2
WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 285	Discrete Structures 285	(7)	WTW 115
WTW 385	Discrete Structures 385	(7)	WTW 126,218,285

Outstanding Credits (88)

Sc.7.7 BACCALAUREUS SCIENTIAE WITH SPECIALISATION IN MATHEMATICAL SCIENCES

(a) Study Programme in Computational Mathematics (Code 02133241)

The study programme in computing mathematics is ideal for the person who is interested in mathematics as well as computers. The programme qualifies the graduate to do especially development work in the field of computers where computer science and appropriate mathematics are needed. Industries, engineering firms and firms that develop computer programmes offer excellent job opportunities, for example as systems analyst or numerical analyst. With appropriate further study, the graduate can qualify him or herself as researcher in order to work on projects in industry, for example the safeguarding of data or the unravelling of codes.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Mathematics Requirements (39)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 220	Analysis 220	(7)	WTW 114,128
WTW 221	Linear Algebra 221	(7)	WTW 211

Compulsory Courses (93)

WTW 115	Discrete Structures 115	(6)	Par.1.2
WTW 123	Numerical Analysis 123	(6)	WTW 114GS
COS 110	Program Design: Introduction 110	(11)	Par.1.2
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 213	Advanced Programming 213	(7)	COS 110/TD
COS 222	Operating Systems 222	(7)	COS 110/TD
COS 221	Databases 221	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
COS 284	Computer Architecture 284	(7)	COS 110/TD
WTW 283	Numerical Analysis 283	(7)	WTW 114,123,128
WTW 285	Discrete Structures 285	(7)	WTW 115
WTW 383	Numerical Analysis 383	(7)	WTW 114,128,211
WTW 385	Discrete Structures 385	(7)	WTW 126,218,285

Limited Choice (14) – two of the following:

WTW 310	Analysis 310	(7)	WTW 220
WTW 381	Algebra 381	(7)	WTW 114,211
WTW 384	Complex Functions 384	(7)	WTW 220/228
WTW 386	Partial Differential Equations 386	(7)	WTW 218,286/282
COS 300 level (-)			

Outstanding Credits (68)

(b) Study Programme in Financial Mathematics (Code 02133382)**

The study programme in Financial Mathematics is interdisciplinary in character for students with an interest in the financial sector. The demand is growing for graduands who are adept in the field of financial models, quantitative and analytical techniques required for the modern decision-making process. Banks, insurance companies and other financial institutions offer excellent employment opportunities. Further study will enable the graduate to work with advanced financial models.

Faculty Requirement (11)

WTW 114 Calculus 114 (11) Par.1.2

General Mathematics Requirements (39)

WTW 126 Linear Algebra 126 (5) WTW 114GS
 WTW 128 Calculus 128 (6) WTW 114GS
 WTW 211 Linear Algebra 211 (7) WTW 126
 WTW 218 Calculus 218 (7) WTW 114,128
 WTW 220 Analysis 220 (7) WTW 114,128
 WTW 221 Linear Algebra 221 (7) WTW 211

Compulsory Courses (125)

WST 151 Mathematical Statistics 151 (5½) Par.1.2
 WST 152 Mathematical Statistics 152 (5½) Par.1.2
 WST 161 Mathematical Statistics 161 (4½) WST 151,152GS
 WST 162 Mathematical Statistics 162 (6½) WST 151,152GS
 EKN 151,152 Economics 151,152 (6) Par.1.2
 EKN 120 Economics 120 (6) EKN 151,152GS
 FRK 151 or Financial Accounting 151 or (8) Par.1.2
 FRK 152 Financial Accounting 152 (8) Par.1.2
 FRK 161,162 Financial Accounting 161,162 (8) FRK 151/152GS
 WTW 286 Differential Equations 286 (7) WTW 114,126,128
 WST 210 Mathematical Statistics 210 (14) WST151,152,161,162
 WTW114,126,128GS
 WST 220 Mathematical Statistics 220 (14) WST 210GS
 ERP 210* or Software Engineering 210 or (7) EIT 110/TDH#
 EPE 220* or Software Engineering 220 or (7) TDH#
 COS 213 Advanced Programming 213 (7) COS 110
 FBS 252,262 Financial Management 252,262 (6) WTW 128, FRK 161,
 162 FRK 151/152GS
 WTW 310 Analysis 310 (7) WTW 220
 WTW 312 Financial Mathematics 312 (7) WTW 218
 WTW 383 Numerical Analysis 383 (7) WTW 114,128,211
 FBS 361 Financial Management 361 (6) FBS 252,262, FRK
 151/15,161,162GS
 WTW 128

Limited Choice (50) – selected from the following:

WTW 115 Discrete Structure 115 (6) Consult Par. 1.2
 WTW 152 Mathematical Modelling 152 (5) Par.1.2
 WTW 123 Numerical Analysis 123 (6) WTW 114GS
 WTW 282 Dynamic Systems 282 (7) WTW 114,286

WTW 285	Discrete Structure 285	(7)	WTW 115
WTW 332	Stochastic Processes 332	(7)	WTW 126,218
WTW 384	Complex Functions 384	(7)	WTW 220/228
WTW 385	Discrete Structure 385	(7)	WTW 126,218,285
WTW 386	Partial Differential Equations 386	(7)	WTW 218,286
EKN 251,252	Economics 251,252	(6)	EKN 151,152/120 With a GS in the Other, Par. 1.2
EKN 220	Economics 220	(6)	EKN 151,152,120/ 251,252 with a GS in the other
EKN 351,352	Economics 351,352	(6)	EKN 151,152,120, 220GS; Par. 1.2
EKN 320	Economics 320	(6)	EKN 210,220 or 310 with a GS in the other
BKW 251, 252	Banking 251, 252	(6)	EKN 120; Par. 1.2
BKW 220	Banking 220	(6)	EKN 251, 252, BKW 251,252GS or FBS 210 GS
BKW 351,352	Banking 351,352	(6)	BKW 220 GS
BKW 320	Banking 320	(6)	BKW 251, 252 BKW 310GS
FBS 252,262	Financial Management 252,262	(6)	WTW 128, FRK 151/152GS, FRK 161,162
FBS 361	Financial Management 361	(6)	FBS 251, 262 FRK 151/152GS, FRK 161,162
WST 310	Mathematical Statistics 310	(14)	WST 210,220; WTW 211,218GS
WST 361	Mathematical Statistics 361	(14)	WST 210,220; WTW 211,218GS
WST 362	Mathematical Statistics 362	(14)	WST 210,220; WTW 211,218GS
COS 110	Programme Design: Introduction 110	(11)	See Par. 1.2
COS 212	Data Structure and Algorithms 212	(7)	COS 110
COS 221	Data Basis 221	(7)	COS 110
COS 301	Software Engineering 301	(7)	COS 212,222,283/TD
COS 332	Computer Science 332	(7)	COS 212,222,283/TD
COS 333	Programme Languages 333	(7)	COS 212,222,283/TD
COS 343	Tendencies in Information Technology 343	(7)	COS 212,222,283/TD

NB:

* A student has to include either ERP 210 or EPE 220 or COS 213 in his or her course. If COS 213 is included in the course, COS 110 must also be taken.

Permission can be obtained from the Head of the Department if a student does not meet the requirements.

** The final study programme must be approved by the Head of the Department.

(c) Study Programme in Applied Mathematics (Code 02133251)

The study programme in Applied Mathematics is suitable for someone who can solve problems in a practical way and who is interested in applying mathematics in the work situation. This programme enables the graduate to work for the CSIR, HSRC, SABS, Transnet, UCOR or ISCOR, and to solve practical problems mathematically for the employer. The graduate will be able to use and evaluate existing problem-solving techniques, but also develop new ones. Further study can equip him or her as mathematical research worker, enabling them to follow a career in research at a university, or to solve problems for the private sector.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Mathematics Requirements (39)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 220	Analysis 220	(7)	WTW 114,128
WTW 221	Linear Algebra 221	(7)	WTW 211

Compulsory Courses (89)

COS 110	Program Design: Introduction 110	(11)	Par.1.2
WTW 115	Discrete Structures 115-	(6)	Par.1.2
WTW 123	Numerical Analysis 123	(6)	WTW 114GS
WTW 152	Mathematical Modelling 152	(5)	Par.1.2
WTW 162	Dynamic Processes 162	(5)	WTW 114,152GS
WTW 282	Dynamical Systems 282	(7)	WTW 114,286
WTW 283	Numerical Analysis 283	(7)	WTW 114,123,128
WTW 285	Discrete Structures 285	(7)	WTW 115
WTW 286	Differential Equations 286	(7)	WTW 114,126,128
COS 212	Data Structures and Algorithms 212	(7)	COS 110/TD
COS 283	Systems Integration 283	(7)	COS 110/TD
WTW 383	Numerical Analysis 383	(7)	WTW 114,128,211
WTW 385	Discrete Structures 385	(7)	WTW 126,218,285

Limited Choice : (21) – three of the following

WTW 310	Analysis 310	(7)	WTW 220
WTW 312	Financial Mathematics 312	(7)	WTW 218
WTW 386	Partial Differential Equations 386	(7)	WTW 218,282/286
WTW 389	Geometry 389	(7)	WTW 211
WTW 332	Stochastic Processes 332	(7)	WTW 126,218

Outstanding Credits (65)**(d) Study Programme in Mathematics (Code 02133261)**

This field of study is meant for the person with a broad interest in Mathematics. It covers a wide spectrum of topics in modern Mathematics. Although it is not directed at

a specific career, the graduate will have a wide selection of career opportunities to choose from:

Mathematical education at secondary level; with the necessary further studies, teaching possibilities at tertiary level, as well as research opportunities in Mathematics at tertiary institutions and research organisations; depending on the choice of subjects, career opportunities in the field of economics, financial and technological sector of private and government institutions that require development work of a mathematical nature.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Mathematics Requirements (39)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 220	Analysis 220	(7)	WTW 114,128
WTW 221	Linear Algebra 221	(7)	WTW 211

Compulsory Courses (21)

WTW 310	Analysis 310	(7)	WTW 220
WTW 381	Algebra 381	(7)	WTW 114,211
WTW 384	Complex Functions 384	(7)	WTW 220,228

limited choice (7) – one of the following:

WTW 383	Numerical Analysis 383	(7)	WTW 114,128,211
WTW 385	Discrete Structures 385	(7)	WTW 126,218,285
WTW 389	Geometry 389	(7)	WTW 211

Outstanding Credits (147)

(e) Study Programme in Mathematical Statistics (Code 02133271)

The study programme in Mathematical Statistics is geared towards the person who is interested in taking on the challenges of collecting, analysing and interpreting scientific data. The Mathematical Statistician uses his or her mathematical talents to solve problems and make decisions possible. Employers include government institutions, research councils, educational and financial organisations, industries and the private sector.

Faculty Requirement (11)

WTW 114	Calculus 114	(11)	Par.1.2
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General Mathematics Requirements (39)

WTW 126	Linear Algebra 126	(5)	WTW 114GS
WTW 128	Calculus 128	(6)	WTW 114GS
WTW 218	Calculus 218	(7)	WTW 114,128
WTW 211	Linear Algebra 211	(7)	WTW 126
WTW 220	Analysis 220	(7)	WTW 114,128
WTW 221	Linear Algebra 221	(7)	WTW 211

Compulsory Courses (78)

WST 151	Mathematical Statistics 151	(5½)	Par.1.2
WST 152	Mathematical Statistics 152	(5½)	Par.1.2
WST 161	Mathematical Statistics 161	(4½)	WST 151,152GS
WST 162	Mathematical Statistics 162	(6½)	WST 151,152GS
WST 210	Mathematical Statistics 210	(14)	WST 151,152; 161, 162, WTW 114, 126, 128GS
WST 220	Mathematical Statistics 220	(14)	WST 210GS
WST 310	Mathematical Statistics 310	(14)	WST 210,220; WTW 211,218GS
WST 361	Mathematical Statistics 361	(7)	WST 210,220; WTW 211,218GS
WST 362	Mathematical Statistics 362	(7)	WST 210,220; WTW 211,218GS

Outstanding Credits (97)

NB: STK 161,162 may not be taken together with WTW 114/101/134;126,128/144. Students who take Mathematical Statistics as a major subject, are strongly advised to include Computer Science 110 and 212,283 in their curriculum.

Sc.8 BACCALAUREUS DEGREES

Sc.8.1 BACCALAUREUS IN INFORMATION TECHNOLOGY (Code 02130082)

The graduate in Information Technology is an expert in and understands the use of IT in organisations, and acts professionally in the design and implementation of IT solutions for such environments. He or she will be able to do small and large-scale programming, to organise and retrieve information optimally, will have quantitative mathematical and sound communication skills, will know how IT infrastructures operate, and have certain career-specific knowledge, depending on the chosen specialisation field.

Prerequisites

A matriculation certificate with university exemption, and at least 50% (D-symbol) in Mathematics and Computer Studies at higher grade.

Duration

Four years full time study.

Curriculum

The required modules are listed below as a suggested study programme. A minimum of 682 credits are required for the degree, with at least 172 at first-year level, and at least 169 at second-year level, at least 169 at third-year level and at least 172 at fourth year level.

NB: The module credits are allocated according to SAQA requirements and therefore differ from the credits allocated to the same modules in other courses.

REQUIRED MODULES

First year of study (min 154)

University Requirement

A pass in one of the exemption examinations or Computer Literacy:

CIL 171	Computer Literacy 171	(3)
CIL 172	Computer Literacy 172	(3)
CIL 173	Computer Literacy 173	(3)
CIL 174	Computer Literacy 174	(3)

A pass in the Language Proficiency test:

EON 151	Language Skills 151	(3)
EON 152	Language Skills 152	(3)
EON 153	Language Skills 153	(3)
EON 154	Language Skills 154	(3)

Compulsory courses

COS 110	Program Design: Introduction 110	(16)	Par 1.2
COS 212	Data Structure and Algorithms 212	(12)	COS 110/TD
COS 283	Systems Integration 283	(12)	COS 110/TD
INF 153	Informatics 153	(6)	Par 1.2
INF 163	Informatics 163	(6)	INF 153GS

Any two ENG modules (min 12, max 30) according to requirements set by the Department of English.

FIL 151	Philosophy 151	(6)	
FIL 153	Philosophy 153	(6)	
STK 151	Statistics 151	(6)	Par 1.2
STK 152	Statistics 152	(6)	Par 1.2
STK 161	Statistics 161	(6)	Par 1.2
STK 162	Statistics 162	(6)	Par 1.2
WTW 115	Discrete Structures 115	(8)	Par 1.2
WTW 152	Mathematical Modelling 152	(8)	Par 1.2
INL 111	Information Science 111	(6)	
INL 112	Information Science 112	(6)	
EKN 151, 152 and	Economics 151, 152 and	(12)	
EKN 120 or	Economics 120 or	(12)	EKN 151,152GS
OBS 151, 152 and	Business Management 151, 152 and	(12)	
OBS 161, 162	Business Management 161, 162	(12)	OBS 151,152GS

Second Year of Study (169)

COS 213	Advanced Programming 213	(7)	COS 110 or TD
COS 221 or	Data Bases 221 or	(7)	COS 110/TD
INF 251 and	Informatics 251 and	(9)	CIL171,172,173,174, INF162/TD
INF 252	Informatics 252	(9)	INF 251GS
INF 261	Informatics 261	(9)	INF 252GS/COS 221
COS 222	Operating Systems 222	(7)	COS 110/TD

COS 284	Computer Architecture 284	(7)	COS 110/TD
INF 253	Informatics 253	(9)	INF 163, par. 1.2
INF 263	Informatics 263	(9)	INF 253GS
INL 211	Information Science 211	(4)	
INL 212	Information Science 212	(5)	
INL 221	Information Science 221	(5)	
FIL 252	Philosophy 252	(10)	
FIL 254	Philosophy 254	(10)	
WTW 285	Discrete structures 285	(12)	WTW 115
EKN 251, 252 and	Economics 251, 252 and	(16)	EKN 151,152/120 with a GS in the other; par 1.2
EKN 220 or	Economics 220 or	(16)	EKN 151,152;120/ EKN 251.252 with a GS in the other
OBS 251, 252 and	Business Management 251, 252 and	(16)	OBS 151,152/OBS 161,162 with a GS in the other, par 1.2
OBS 261, 262	Business Management 261,262	(16)	OBS 151,152/ OBS 161,162, with a GS in the other, par 1.2

Third Year of Study (min 187)

COS 301 or	Program Engineering 301 or	(18)	COS 110/TD
INF 353 and	Informatics 353 and	(11)	INF 253,263
INF 354 and	Informatics 354 and	(11)	INF 263, par 1.2
INF 363	Informatics 363	(11)	INF 353GS
COS 332 or	Computer Networks 332 or	(18)	COS 283/TD
INF 351 and	Informatics 351 and	(11)	CIL171,172,173,174, INF 262/TD
INF 352	Informatics 352	(11)	INF 351GS
INF 361	Informatics 361	(11)	INF 263
INF 362	Informatics 362	(11)	INF 361GS
INL 311	Information Science 311	(15)	
INL 321	Information Science 321	(15)	
INY 311	Multimedia 311	(15)	
INY 325	Interface Design 325	(15)	
INY 326	Mark-up Languages 326	(15)	
FRK 151	Financial Accounting 151	(6)	Par 1.2
FRK 152	Financial Accounting 152	(6)	Par 1.2
FRK 161	Financial Accounting 161	(6)	FRK 152GS
FRK 162	Financial Accounting 162	(6)	FRK 161GS

At least two of the following:

COS 343	Tendencies in Information Technology 343	(18)	COS 110/TD
COS 314	Artificial Inteligence 314	(18)	COS 110/TD
COS 324	Concurrent and Distributive Systems 324	(18)	COS 222/TD
COS 333	Programming Languages 333_	(18)	COS 110/TD
COS 341	Compiler Construction 341	(18)	COS 212/TD

Fourth Year of Study(172)

- (a) BER 410 Business Law 410 (12)
- (b) **Four modules (min 80 credits) from the following, of which at most 2 may be from:**

Information Science

INY 701	Information Management 701	(32)
INY 702	Information Retrieval 702	(32)
INY 703	Multimedia 703	(32)

Informatics

INF 781	Information Security 781	(20)
INF 782	Electronic Commerce 782	(20)
INF 783	Computer-Supported Work 783	(20)
INF 785	Advanced Data Base Systems 785	(20)
INF 787	Management of Projects and End Users 787	(20)

Computer Science

GRF 780	Graphics 780	(20)
KMI 780	Artificial Intelligence 780	(20)
PIN 780	Software Engineering 780	(20)
RNW 780	Networks 780	(20)
VRS 780	Distributed Computer Systems 780	(20)

- (c) **Four modules (80 credits selected from the modules to be offered in co-operation with Industry.**

- (d) **Degree with distinction**

The BInformation Technology is conferred with distinction on a student who passes all prescribed courses in the fourth year of study in a single academic year, and obtains a weighted average of at least 75% in those courses, provided that a sub-minimum of 65% is required in each of those courses.

**Sc.8.2 BACCALAUREUS SECUNDAE EDUCATIONIS (SCIENTIAE) BSecEd(Sci)
(Code 02135001)**

- (a) **Articulation possibilities**

Candidates who meet all the requirements for the DipEd(Sci) degree, can be considered for admission to studies for the BSecEd(Sci). Applicable subjects which have been passed, will be recognised for the degree.

- (b) **Admission requirements**

A matriculation exemption certificate with Mathematics and Physical Science at higher grade with at least 50% (D), as well as two official languages, including English or Afrikaans (first or second language) at higher grade with at least 50% (D).

The Sciences: Extended Programme (Renaissance) is also applicable with regards to the BSecEd(Sci) degree.

NB: Candidates who do not comply with the requirement regarding Physical Science may only be admitted to the degree if the study programme is compiled from courses for which Physical Science is not a prerequisite.

(c) Duration

Four years of full-time study.

(d) Curriculum

A minimum of 289 credits are required to obtain the degree.

Faculty Requirement (11)

WTW 114	or Calculus 114	or	(11)	Par.1.2
WTW 134	Mathematics 134		(11)	Par.1.2

General Requirements (108)

SCI 152	Computer and Problem-solving Skills 152	(6)	
SCI 153	Academic Proficiency 153	(2)	
SCI 163	Basic Research Skills 163	(2)	
CIL 173	Spread Sheets 173	(2)	
EON 151	Basic Language Skills 151	(2)	
EON 152	Basic Language Skills 152	(2)	
EON 153	Basic language Skills 153	(2)	
EON 154	Basic Language Skills 154	(2)	
SCE 170	Religious Instruction 170	(4)	
SCE 200	Science Education 200	(10)	
SCE 300	Science Education 300	(16)	SCE 200 and one Subject didactics
SCE 301	Educational Community Project 301	(10)	SCE 200 and one Subject didactics
SCE 302	School Practice 302	(22)	SCE 200 and one subject didactics
SCE 400	Science Education 3	(16)	SCE 300
SCE 402	School Practice 402	(10)	Two school subjects at 200 level and two subject didactics
TED 400	Language Endorsement 400		

Additional Requirement

Two year courses† at 200 level, both of which should be recognised school subjects.

Limited Choice (56)

Subject didactics from:

SCE 471	Subject Didactics of Biology 471	(14)	BLG 150,160/ MLB 111, ZEN 122/ BOT 120
SCE 472	Subject Didactics of Geography 472	(14)	GGY 151,132, GGY 161,162
SCE 473	Subject Didactics of Agriculture 473	(14)	AGC 150,160
SCE 474	Subject Didactics of Physical Science 474	(14)	PHY 171; CMY 131,141

SCE 475	Subject Didactics of Computer Studies 475	(14)	COS 110,212,283
SCE 476	Subject Didactics of Mathematics 476	(14)	WTW 114/126,128

At least 28 credits at 300 level of a single year course (two sequential semester courses) that is presented in the Faculty of Natural, Agricultural and Information Sciences.

Outstanding Credits

Outstanding credits are compiled from two additional year courses† (consisting of two consecutive semester courses each), which can be a third subject didactics, and a semester course, or a year course of at least 11 credits.

Students may, in consultation with the Dean, take courses not listed in Sc.4 and which are the equivalent of a maximum of 22 credits.

(e) Teaching Practice

A student must gain teaching experience by:

- (i) Attending demonstration lessons.
- (ii) School Practice 302 and 402.
- (iii) Compulsory Subject Didactics courses.
- (iv) Educational Community Project (SCE 301)

(f) Language Endorsement

Students must demonstrate the ability to teach in at least two official languages, of which one must be either English or Afrikaans.

(g) Compulsory language modules

Subject to satisfactory performance in the prescribed language test, all or some of the above language skills modules (EON 151 – 154) may be replaced by approved language modules of equal weight.

(h) Religious Instruction (SCE 170)

Required by the Department of Education. A student may apply for exemption on the grounds of conscientious objections, only if a course of at least 4 credits is taken instead of Religious Instruction.

(i) Professional Studies

Professional Studies consist of the required Subject Didactics, the Educational Community Project (SCE 301) and Sciences (SCI 101 or 102).

(j) Education

Education consist of Science Education (SCE 200, 300 and 400).

(k) Recognised School Subjects

Course	Level	Modules
Biology*††	100	BLG 150,160 or MLB 111 and ZEN 121,122 or BOT 120
Biology*††	200	BLG 250,360, BOT 227 or appropriate modules in Botany or Zoology/Entomology or Physiology at 200 level.
Chemistry**	100	CMY 131,141/101,102
Chemistry**	200	CMY 282,283,284,285

Physics**	100	PHY 171/101,102
Physics**	200	PHY 216,225,226
Natural Science	200	PHY 131; GLY 161, GGY 252, 361, GLY 162/ GGY 161/ Combination of appropriate modules in Chemistry and Physics at 200 level, on the recommendation of the Head of Department and with the approval of the Dean.
Geography	100	GGY 151, 132, 161, 162
Geography	200	GGY 251, 252, 261, 262
Agriculture††	100	AGC 150,160
Agriculture††	200	AGC 250,260
Computer Science	100	COS 110, COS 160/COS 110, 212, 283
Computer Science	200	4 modules from: COS 212, 213, 221, 222, 283,284. COS 212 and 283 May not both count up to 100 and 200 level.
Mathematics	100	WTW 114/101,126,128/102/ WTW 134,144
Mathematics	200	WTW 211,218,215,289

NB: All modules of a course must be passed for the course to be recognised as a school subject.

* Zoology, Botany and Biology is the equivalent of only one recognised school subject. A recognised course must be passed at 100 level.

** Physics, Chemistry and Physical Science is the equivalent of only one recognised school subject and is only accepted if a full year course (two consecutive semester courses) is passed in both Chemistry and Physics at 100 level.

†† The combination BLG 150,160,250,360, BOT 227 is the equivalent of Biology at 200 level, but does not lead to admission to courses at 300 level.

The combination with MLB 111, BOT 120, ZEN 122 together with appropriate second-year courses in Zoology, Botany and Physiology can lead to admission to courses at 300 level.

The combination AGC 150,160,250,260 is the equivalent of Agriculture at 200 level, but does not lead to admission to courses at 300 level. For more information and other acceptable combinations for recognition as school subjects in agricultural fields, consult the Regulations and Syllabuses: Faculty of Natural, Agricultural and Information Sciences Part II.

(l) Special examination

A final year student who requires a maximum of 28 credits to comply with all the requirements for the degree, may be admitted by the Dean on the recommendation of the relevant Head(s) of Department(s), to special examinations in the course(s) he or she has failed, provided that this will enable them to qualify for the degree. Students with a final mark of less than 40% in any of the failed courses, or who have previously been admitted to a special examination, do not qualify for a special examination.

(m) Degree with distinction

The BSecEd(Sci) degree is conferred with distinction on a student who obtains a weighted average of at least 75% in:

- (i) Compulsory year course at 300 level.

- (ii) One Subject Didactics.
- (iii) Science Education 400.
- (iv) School Practice 402.

A weighted average of at least 65% in the other courses at 400 level is an additional requirement.

Sc.9 DIPLOMAS

Sc.9.1 DIPLOMA IN EDUCATION WITH SPECIALISATION IN SCIENCES FOR THE SECONDARY PHASE [DipEd(Sci)] (Code 02120700)

(a) Admission Requirements

A Matriculation exemption certificate endorsed for University admission and Mathematics and Physical Science at higher grade with at least 50% (D), as well as two official languages, including English or Afrikaans (first or second language) at higher grade with at least 50% (D). The Science: Extended Programme (Renaissance) also applies to the Dip Ed (Sci).

Exit Level: Admission requirement

Students who have been registered for at least one year for the BSecEd(Sci), BSc, BSc(Agric) or the Science: Extended Programme (Renaissance), or Biological and Agricultural Sciences: Extended Programme, may be considered for admission to DipEd(Sci) study. Applicable subject courses can be recognised for the Diploma.

NB: Students who do not comply with the requirement regarding Physical Science, may only be admitted to the diploma if the study programme is compiled from courses for which Physical Science is not a prerequisite.

(b) Duration

Three years of full-time study

(c) Curriculum

A minimum of 204 credits is required to obtain the diploma.

Faculty Requirement (11)

WTW 114	or Calculus 114	(11)	Par.1.2
WTW 134	Mathematics 134	(11)	Par.1.2

General Requirement (82)

SCI 152	Computer and Problem-solving Skills 152	(6)	
SCI 153	Academic Proficiency 153	(2)	
SCI 163	Basic Research Skills 163	(2)	
CIL 173	Spread Sheet 173	(2)	
EON 151	Basic Language Skills 151	(2)	
EON 152	Basic Language Skills 152	(2)	
EON 153	Basic Language Skills 153	(2)	
EON 154	Basic Language Skills 154	(2)	
SCE 170	Religious Instruction 170	(4)	

SCE 200	Science Education 200	(10)	
SCE 300	Science Education 300	(16)	SCE 200 and one subject didactic
SCE 301	Educational Community Project	(10)	SCE 200 and one subject didactic
SCE 302	Teaching Practice 302	(22)	SCE 200 and one subject didactic
TED 400	Language Endorsement 400		

Additional Requirement

One year course† to 200-level which is recognised as a school subject.

One year course† at least 100-level which is recognised as a school subject.

Limited Choice (28)

Two didactic courses from

SCE 471	Subject Didactics of Biology 471	(14)	BLG150,160/MLB111 and ZEN122/BOT120
SCE 472	Subject Didactics of Geography 472	(14)	GGY132,151,161,162
SCE 473	Subject Didactics of Agriculture 473	(14)	AGC 150, 160
SCE 474	Subject Didactics of Physical Science 474	(14)	PHY 171, CMY 131,141
SCE 475	Subject Didactics of Computer Studies 475	(14)	COS 110/CIL 171, 172,173 and 160
SCE 476	Subject Didactics of Mathematics 476	(14)	WTW 114/101, 126, 128/102

Outstanding Credits

Outstanding credits are compiled from one additional year course, and a semester course or year course of at least 11 units. It is recommended that the year course be a language course.

Students may, in consultation with the Dean, take courses not listed in Sc. 4 and which are the equivalent of a maximum of 22 credits.

† A year course is two successive semester courses, which equals a year course.

(d) Teaching Practice

A student must gain teaching experience by

- (i) attending demonstration lessons.
- (ii) teaching Practice 302
- (iii) compulsory subject didactics courses
- (iv) Educational Community Project (SCE 301)

(e) Language Endorsement

A student must prove his or her ability to teach in at least two official languages of which one should be either English or Afrikaans.

(f) Religious Instruction (SCE 170)

Is required by the Department of Education. A student may on the grounds of conscientious objection apply in writing for exemption, in which case a course of at least 4 credits has to be taken in the place of Religious Instruction.

(g) Compulsory language modules

Subject to satisfactory performance in the prescribed language test, all or some of the above language skills modules (EON 151 – 154) may be replaced by approved language modules of equal weight.

(h) Professional Studies

Professional studies consist of the required Subject Didactics, the Educational Community Project (SCE 301) and Science Orientation (SCI 101 or SCI 102)

(i) Education

Education consists of Science Education SCE 200 and SCE 300.

(j) Recognised School Subjects

Refer to Sc 8.1 (k)

(k) Special examination

A final year student who requires a maximum of 28 credits to comply with all the requirements for the degree, may be admitted by the Dean on the recommendation of the relevant Head(s) of Department(s) to special examinations in the course(s) he or she has failed, provided that this will enable them to qualify for the degree. Students with a final mark of less than 40% in any of the failed courses, or who have previously been admitted to a special examination, do not qualify for a special examination.

(l) Diploma awarded with distinction

The Dip Ed (Sci) is conferred with distinction on a student who obtains a weighted average of at least 75% in the compulsory year course at 200-level, one subject didactics, Science Education 300, and Teaching Practice 302, with a weighted average of at least 65% over-all in courses recognised for the diploma.

(m) Recognition of subject courses for the BSecEd(Sci)

A student who meets all the requirements for the diploma, may complete the BSecEd(Sci) at a later stage. Subject courses presented for the DipEd(Sci) may be presented for the BSecEd(Sci).

Sc.9.2 FURTHER DIPLOMA IN EDUCATION (COMPUTERS AND TELECOMMUNICATIONS IN MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION) (FDE) (Code 02120100)

(a) Admission

A Professional teaching qualification of at least three years full-time study (M+3) in the learning areas of mathematics, natural science or technology.

(b) Duration

The equivalent of one year of full-time or two years of part-time study.

(c) Curriculum

First year of study

SEF 481 Current trends in Mathematics, Science and Technology Education 481
SEF 482 Computers in Mathematics, Science and Technology Education 482

Second year of study

SEF 483 Computers in mathematics, science and technology education 483

SEF 484 The computer as a laboratory and classroom tool

One of the following:

SEF 485 Networking Software and Hardware 485, or

RTS 410 Computer Assisted Testing 410 (offered by the Faculty of Education).

(d) Special examination

A final year student who has failed a maximum of one semester or year course and has obtained a final mark of at least 40%, may be admitted by the Dean to a special examination in such a course during January of the following year, provided that this will enable him or her to qualify for the diploma.

(e) Diploma with distinction

The diploma will be awarded with distinction if the student has achieved at least 75% in the courses SEF 481 and SEF 483, and at least 65% in the remaining courses.

<p>Sc 9.3 FURTHER DIPLOMA IN EDUCATION (Mathematics and Science) FDE (Mathematics and Science) (Code 02120101)</p>

(a) Admission

A professional teaching qualification of at least three years full time (M+3) in the learning areas of mathematics, natural science or technology.

(b) Duration

The equivalent of one year of full-time or two years of part-time study.

(c) Curriculum

First year of Study

SEF 481 Current trends in mathematics, science and technology education 481

SEF 471 Mathematics 471

SEF 472 First course in Chemistry 472

Second year of Study

SEF 473 General Physics 473

both (SEF 474 Earth Sciences 474 and SEF 475 Mathematics 475), **or**

one of (SEF 474 or SEF 475) **plus** another course of the same weight approved by the Faculty of Natural, Agricultural and Information Sciences or Education for degree purposes or for a Further Diploma in education subject to approval by the Dean of the Faculty.

(d) Special examination

A final year student who has failed in no more than one semester course or one year course and has achieved a final mark of at least 40%, may be permitted by the dean to sit for a special examination in January of the following year on condition that the student then satisfies all the requirements of the diploma.

(e) Diploma with distinction

To pass the diploma with distinction, a student must pass both SEF 481 and SEF 471 with at least 75% and the remaining subjects with at least 65%.

Sc.9.4 POSTGRADUATE DIPLOMA IN EARTH SCIENCE PRACTICE AND MANAGEMENT (Code 02220043)

(a) Admission requirements

BSc(Hons) in Geology or equal four-year degree, or any other qualification deemed by the Senate in terms of Regulation G.62 to be equal. Additional preparatory course work may be required by the Head of the Department.

(b) Duration

The minimum duration is two years of part-time studies. The curriculum is determined in consultation with the Head of Department. The courses consist of theoretical modules (16 credits).

(c) Examination admission and pass requirements

To be admitted to the examination, a student must have a semester or year mark of at least 40 %. A subminimum of 40% is required in the examination to pass, and the final mark must be 50% or more

In some modules a semester or year mark may not be required. In such cases, the examination mark must be 50% or more to pass. The modules where this is the case, are indicated in the departmental guides.

(d) Diploma with distinction

The diploma is awarded with distinction if a student has an average of at least 75% in 50% of the theoretical modules (based on course credits), as well as an average of at least 65% in the remaining theoretical modules.

(e) Articulation possibilities for admission to Magister Scientiae in Earth Science Practice and Management

Successful completion of the Diploma can offer articulation admission to the MSc with specialisation in Earth Sciences and Management, for which an essay on an approved subject is a prerequisite.

Students who have registered for the MSc, but fail to submit an essay within one calendar year of completion of the theoretical portion, qualify for the Postgraduate Diploma in Earth Science Practice and Management.

Sc 9.5 POSTGRADUATE DIPLOMA IN GEOGRAPHICAL INFORMATION SYSTEMS (GIS) (Code 02220041)
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Admission

An appropriate B degree normally, or any other qualification deemed to be equal by the Senate of the University.

Duration

Two years of telematic tuition, but arrangements are being made for a full-time programme of one year.

Aim

Geographic Information Systems (GIS) are an aid which is used by a variety of businesses and disciplines for the processing of data and presentation of information for decision making. The programme in GIS covers the conceptual, technical and organisational aspects of geographic data and data processing, as well as its application possibilities. The programme aims to introduce people from various disciplines to and train them in the use of new technology of geographic data processing.

Presentation

The programme is presented telematically (distance education) and students do not have to attend lectures. Discussion sessions can be arranged.

Curriculum

The curriculum is compiled in consultation with the Head of Department.

(GIS 780)	GIS Introduction 780
(GIS 781)	Geographic Data Management 781
(GIS 782)	Geographic Data Sources 782
(GIS 783)	Geographic Analysis 783
(GIS 784)	GIS Management 784
(GIS 785)	GIS for Environmental Science 785 (20 lectures)

Sc.9.6 POSTGRADUATE DIPLOMA IN ENVIRONMENT AND SOCIETY (Code 02220042)

(a) Admission requirements

BSc(Hons) in Geography or equal four-year degree, or any other qualification deemed by the Senate in terms of Regulation G.1.3 and G.62 as being equal to the BSc(Hons). Additional preparatory course work may be set by the Head of Department.

(b) Evaluation

Evaluation of progress will be done throughout the study by means of tasks, projects, tests and examinations.

(c) External evaluation

Oral and written examinations will be moderated by external examiners.

(d) Curriculum

A minimum of 7 subject courses is required for the diploma.

(e) Compulsory course

(OMS 880) Environment and Society 880

(f) Outstanding courses: selected from

- (OMS 881) Environmental Change (881)
- (OMS 882) Southern African Morphology 882
- (OMS 883) Polar and Mountain Environments 883

(OMS 884) Environment and Development 884
or subject courses selected in consultation with the Head of Department.

(g) Articulation possibilities for admission to the Magister Scientiae in Environment and Society

Successful completion of the Diploma can offer articulation admission to the MSc with specialisation in Environment and Society, for which an essay on an approved subject is required.

Students who are registered for the MSc and fail to submit the essay within one calendar year of completing the theoretical portion of the work, qualify for the Postgraduate Diploma in Environment and Society.

SYLLABI FOR NATURAL SCIENCES

Abbreviations:

l.p.w. = lectures per week

p. = practicals (a practical class normally lasts 3 hours)

EARTH SCIENCES

(GLY 151) Introductory Geology 151 (4 l.p.w. and 1 p.p.w)

Solar system; structure of solid matter; minerals and rocks; introduction to symmetry and crystallography; important minerals and solid solutions; rock cycle; classification of rocks.

(GLY 152) Physical Geology 152 (4 l.p.w. en 1 p.p.w)

External geological processes (gravity, water, wind, sea, ice) and their products (including geomorphology). Internal structure of the Earth. The dynamic Earth – volcanism, earthquakes, mountain building – the theory of plate tectonics. Geological processes (magmatism, metamorphism, sedimentology, structural geology) in a plate tectonic context. Geological maps and profiles.

(GLY 161) Historical Geology 161 (4 l.p.w. en 1 p.p.w)

Principles of stratigraphy and stratigraphic nomenclature; geological dating and international and SA time scales; Africa framework and tectonic elements of SA; introduction to depositional environments. Overview of the historical geology of SA, from the Archaean to the present: major stratigraphic units, intrusions and tectonic-metamorphic events - their rock types, fossil contents, genesis and economic commodities. Principles of palaeontology and short description of major fossil groups: fossil forms, ecology and geological meaning.

(GLY 162) Environmental Geology 162 (4 l.p.w. en 1 p.p.w)

Geological processes and their influence on man's environment: earthquakes, volcanoes, slope movement, subsidence, floods, coastal processes, meteorite impacts, atmospheric changes. Natural resource utilisation and the impact of man on the geological environment: urban development, dams, mining, agriculture, transport systems, heavy structures, construction materials, ground water extraction, waste disposal, environmental pollution.

(GLY 214) Crystal Optics and Crystal Chemistry 214 (4 l.p.w. en 2 p.p.w)

The properties of light in isotropic and anisotropic solids; the polarizing microscope; nature and identification of isotropic, uniaxial and biaxial crystals in transmitted and reflected light. Atoms and atomic structure; crystal structure and crystal field theory.

(GLY 244) Mineralogy 244 (4 l.p.w. en 2 p.p.w)

Phase rule of Willard Gibbs. Phase diagrams in pressure-temperature-compositional space. One and two component systems. Systematic review of the major rock-forming silicate, sulphide and oxide minerals in terms of optical properties, crystal structure, crystal chemistry, pressure-temperature conditions of formation, alteration and association in rock systems. Optical identification and description of minerals and their mutual relationships in thin section.

(GLY 245) Metamorphic Petrology 245 (4 l.p.w. en 2 p.p.w)

Classification of metamorphic rocks. Anatexis, migmatite and granite; eclogite. Metamorphic textures. PT-time loops. Metamorphism in various plate tectonic environments.

(GLY 261) Igneous Petrology (4 l.p.w. en 2 p.p.w)

Classification and nomenclature of igneous rocks. The nature of silicate melts; physical and chemical factors influencing crystallisation and textures of igneous rocks. Phase diagrams, fractional crystallisation and partial melting. Trace elements and isotopes, and their use in petrogenetic studies. Global distribution of magmatism and its origin. Mid oceanic ridges, active continental margins, intraplate magmatism.

(GLY 263) S.A. Stratigraphy en Engineering Geology 263 (4 l.p.w. en 2 p.p.w)

The crustal development of southern Africa and the geomorphologic history of the Post-Gondwana era. The engineering geological properties and problems associated with the different lithostratigraphic units occurring in southern Africa. Mapping techniques.

(GLY 264) Introduction to Geophysics 264 (4 l.p.w. en 2 p.p.w)

Physical properties of rocks and minerals relevant to exploration geophysics: 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. Mapping techniques.

(GLY 181) Earth Systems 181 (3 l.p.w in both semesters) (from 2000)

The course presents a broad earth scientific review of the environment in which humans find themselves today. The course is not mathematical and is suitable for students from other faculties, as well as for teachers in general sciences, and persons who wish to broaden their knowledge of the human environment, without obtaining a degree. Subjects which are covered, include the birth and development of the universe (including the Big Bang), development of weather patterns (including El Nino), earthquakes, volcanoes, moving continents, groundwater, surface water, the ice caps and ice age, soil formation en use, plant ecology and utilisation, microbiological processes, and the place which man fills in all of this.

(GLY 215) Sedimentology 215 (34 l. and 14 p.)

Introduction to sedimentology; composition and textures of sedimentary rock; fluid dynamics, behaviour and sediment particles in transport systems and sedimentary structures; diagenesis; depositional environments and their sedimentary rocks; chemical sedimentary rock, especially iron formations; economic sedimentology; field survey of

sedimentary rock and writing of reports; grain size analyses; electron microscope study of grains of sediment.

(GLY 216) Structural Geology 216 (22 l. and 14 p.)

The behaviour of rock under stress; brittle and ductile strain of rock material; folding mechanisms, tectonic fabrics; fault systems.

Practical work comprises Mohr diagrams and the use of stereographical projections in structural geology; mining structural problems; sheet map description.

(GLY 243) Mapping 243 (14 p.)

Geological mapping (during winter recess)

(GLY 313) Igneous Petrology 313 (28 l. and 15 p.)

Experimental petrology; interpretation of binary and ternary phase diagrams. Smelting and crystallisation of natural rock materials. Formation and diversification of magmas. Application of trace elements and isotope geochemistry in igneous petrogenesis. Development of basalts, andesites and granites. Practical work: Interpretation of igneous textures, phase diagrams and crystallisation series. Introduction to geochemical modelling.

(GLY 319) Exploration Geochemistry 319 (28 l. and 13 p.)

Methods of geochemical explorations in the search for ore deposits; processing, presentation and interpretation of field studies. Practical exercises in geochemical modelling.

(GLY 323) Economic Geology 323 (4 l.p.w. and 2 p.p.w.)

Ore deposits (43 l. and 20 p.) Mineral resources and reserves; formation and classification of ore deposits; discussion of rock and mineral associations of various mineral depositions, as well as coal and petroleum.

Geostatistics (9 l and 4 p.) Traditional geostatistical methods, problem evaluation, descriptive statistics, normal, log normal and three parameter log normal distributions, student-t, confidence intervals, Sinchel-t, sampling, cut-off points, timetable generation and polynomial curve fitting techniques, semi-variogram, error estimation, kriging.

Practical work: Sedimentary petrography (4 p.), ore microscopy (11 p.) mineral associations; hand-specimens (11 p.)

(GLY 381) Mapping Camp 381 (14 p.)

Geological mapping with the aid of aerial photographs.

(GPH 311) Numeric Methods 311 (3 l.p.w. and 1 p.p.w.)

Numeric techniques for interpolation, integration and differentiation. Numeric Fourier analysis, z-transformation and the design of seepage filters, the dirac-delta, convolution, correlation and inversion techniques.

(GPH 312) Gravitation and Magnetic Methods 312 (3 l.p.w. and 1 p.p.w.)

Potential field theory, instrumentation and field procedure, data reduction and interpretation. Gravity map of South Africa. Special attention to filtering and modelling of gravitation and magnetic data.

(GPH 321) Electrical and Radiometric Methods 321 (2 l.p.w. and 2 p.p.w.)

Physical principles and theoretical background of direct current electrical and radiometric methods. Instrumentation and field procedure. Interpretation and inversion.

(GTX 311) Engineering Geology of SA 311 (1 l.p.w. and p.p.w.)

Engineering geological properties and problems associated with different stratigraphic units.

(GTX 312) Soil Mechanics 312 (3 l.p.w. and 1 x p.p.w.)

Capita selecta from SGM 322.

(GTX 314) Environmental Hydrogeology 314 (2 l.p.w)

Subsurface water hydraulics; pump tests; hydrochemistry; pollution; rehabilitation; monitoring; Classification of aquifers; Quality control of subsurface water.

(GTX 321) Site Investigation 321 (1 l.p.w and 1 p.p.w.)

Engineering geological mapping; field and laboratory investigations; data processing; writing of reports.

(GTX 324) Rock Mechanics 327 (1 l.p.w and 1 p.p.w.)

Principles of rock mechanics; rock failure theories, mineralogy, dynamic characteristics, rock excavations, constructions using rock material.

(GTX 325) Geological Environmental Management 325 (2 l.p.w.)

Integrated environmental management; resource management and planning; landscape evaluation, environmental legislation; environmental impact analysis; geological aspects of importance concerning refuse removal and management.

METEOROLOGY

(WKD 111) Atmospheric Processes 111 (4 lectures + 1 tutorial of 2 hours for 7 weeks)

Weather and climate. Composition of the atmosphere. Temperature distribution. Heat capacity between land and water. Atmospheric mass and pressure. Horizontal and vertical pressure variation. Hadley and Walker circulation. ENSO. Radiation. Zenith angle of the sun. Sunshine variability. Climate (heat exchange, orography and circulation). The 'foehn' effect. Climate change. The natural and artificial green-house effect. Heat transfer in the boundary layer. Atmospheric heat budget. Urban and rural climates. Equation of state. Phases of water and latent heat. Vapor pressure. Saturation vapor pressure. Dewpoint temperature and relative humidity. Cloud formation. Sensible heat. Comfort zones. Acquisition of data from the South African Weather Bureau. Composition of a report and submission of the results.

(WKD 112) Atmospheric Circulation 112 (4 lectures + 1 tutorial of 2 hours for 7 weeks)

Radiation. Hadley and Walker circulation. ENSO. Horizontal and vertical pressure differences and circulation. Convergence, divergence, convection and subsidence. Polar stratospheric ozone. Continental and horizontal pressure distribution. Air parcel theory. Adiabatic processes. Angular velocity of the earth. Gravitational force. Gravity force. Centrifugal force. Pressure gradient force. Coriolis force. Friction force. Rotation of a cyclone and anti-cyclone. Geostrophic wind. Convection. Vapor pressure. Dry adiabatic, wet adiabatics and environmental temperature lapse rates. Development of a cloud (air parcel theory). Phases of air mass thunderstorms. Inter-tropical convergence zones (ITCZ). Monsoon rains. Mid-latitude cyclonic frontal systems. Cut-off low. Coastal low. Jet streams. Tropical cyclones. Typical circulation patterns over South Africa. Weather map analyses. Composition and submission of a report.

WKD 121) Physical and meso scale Meteorology 121 (4 lectures + 1 tutorial of 2 hours for 7 weeks)

Origin of the atmosphere. Oxygen, carbon and life. Interaction between the atmosphere and biosphere. Electromagnetic spectrum. Planck's constant. Radiation energy. Irradiation and radiation. Albedo. Stefan Boltzman law. Global energy balance. Gas laws. First law of thermodynamics. Stability and instability. Cloud processes. Atmospheric particles. Homogeneous and heterogeneous nucleation. Droplet growth. Microphysics of cold clouds. Lightning. Air mass thunderstorms. Multi-cell storms. Layered clouds. Radiation and advection mist. Orographic clouds and Lee waves. Case study of a local thunderstorm. Composition and submission of a report.

(WKD 122) Dynamical and Numerical Meteorology 122 (4 lectures + 1 tutorial of 2 hours for 7 weeks)

Dimension and units. Atmospheric scales of motion. Hydrostatic assumptions. Hypsometric equation. Statistical seasonal assessment and the ENSO. Spatial data interpretation and grid fields. Representation of isobars and the geostrophic wind. Deduction of the height of a 500 hPa pressure level. Pressure gradient and Coriolis forces. Introduction to finite differentiation methods. Vorticity and divergence. Numerical estimation of the geostrophic wind, vorticity and divergence. Advection and temperature. Development of a two-dimensional numerical advection prediction model. Composition and submission of a report.

(WKD 123) Weather forecasting principles 123 (4 lectures for 7 weeks)

Classification of weather types. Synoptic and METAR messages. Weather data on the Internet. Introduction to satellite images, tephigrams and synoptic charts.

(WKD 213) Introduction to Weather forecasting 213 (5 lectures for 7 weeks)

Synoptic codes: METAR, upper air, land and ship. Chart analysis, analysis of satellite images and the tephigram. Introduction to marine forecasting.

(WKD 214) Weather forecasting techniques 214 (5 lectures for 7 weeks)

Description, evaluation and interpretation of numerical products. Trough-ridge systems. Sutcliffe's theory. Maritime and continental clouds. Compilation of a weather report. Marine forecasting.

(WKD 215) Community Project 215 (3 lectures for 14 weeks)

Identification and execution of a community project with the aim to provide meteorological information to the general South African public. A project proposal including a budget will be drawn up before the project commences and a project report will be drawn up after completion of the project.

(WKD 222) Physical Meteorology 222 (4 lectures for 7 weeks)

Conservative forces and conservation laws. Basic thermodynamical laws for dry and humid air. The equation of state. Adiabatic processes and lapse rates. Clausius Claperon equation. Calculation of the wet adiabat.

(WKD 223) Climate 223 (2 lectures + 1 tutorial of 2 hours for 7 weeks)

Global radiation and energy balance. Paleoclimatology. Global warming and climate change. Climate impacts and modelling. Action to stabilise man-made climate change. Research project.

(WKD 224) Marine Meteorology 224 (2 lectures))

Climatological characteristics of the ocean. Physical characteristics of ocean waves, wave creating processes, mechanisms and degeneration of waves. Nomogrammes and drainage.

(WKD 314) Dynamic Meteorology 314 (4 lectures and 1 tutorial of 2 hours for 14 weeks)

The fundamental conservation laws on the rotating earth. Coordinate transformation. The isobaric system. Scaling. The thermal wind. Circulation and vorticity. Isentropic and sigma coordinates.

Practical work: Computer applications and computation of a geopotential field.

(WKD 324) Dynamic Meteorology 324 (4 lectures for 14 weeks)

The quasi geostrophic system. The tendency and omega equations. Model of a baroclinical system. The Q vector. Introductory numerical models.

(WKD 325) Dynamic Meteorology 325 (2 lectures + 1 tutorial of 2 hours for 7 weeks)

Introduction to cloud dynamics. Classification and development of clouds. Cumulonimbus clouds, super cells and tornadoes.

(WKD 381) Research Project 381 (2 practicals of 2 hours for 14 weeks)

A meteorological phenomenon must be researched. A research proposal will be drawn up with production of a conceptional research article on completion of the research work.

DEPARTMENT OF CHEMISTRY

(CMY 101) First course in Chemistry 101 (first semester: 4 lectures + 1 p. + 2 tutorials; second semester: 3 tutorials, 1 computer session)

The same syllabus as for CMY 131. Lectures and practicals are presented together with CMY 131 during the first semester, with two additional tutor sessions per week. During the second semester, the course is enriched through repetition with three tutorial sessions and one computer session.

(CMY 102) General Chemistry 102 (first semester: 4 lectures (tutor and computer sessions will be determined annually by the lecturer); second semester: 4 lectures, 1x2 h tutor sessions and 1p.)

The same syllabus as for CMY 141. Lectures and practicals are presented together with CMY 141 during the second semester, with two additional tutorial sessions per week. During the first semester, the course is introduced by presenting three lecture/tutorial sessions and one computer session. Most of the content of the syllabus is therefore repeated during the second semester.

(CMY 131) First course in Chemistry 131 (4 lectures + 1 p.)

Theory: General introduction to atoms, elements, nomenclature, chemical bonding and structure, chemical reactions, reaction stoichiometry, and chemical equilibrium (equilibrium systems, acids and bases, precipitation and complex formation).

Practical work: Synthesis, isolation, purification and properties of simple organic compounds, molecular structure (model-building sessions), and the quantitative and qualitative analysis of appropriate elements and compounds.

(CMY 141) General Chemistry 141 (4 lectures + 1 p.)

Theory: General physical-inorganic chemistry: Physical behaviour of gases, liquids and solids, intermolecular forces, solutions, thermochemistry and chemical thermodynamics, electrochemistry. Descriptive inorganic chemistry: Main group and transition elements. Organic chemistry: Structure (bonding), nomenclature, isomerism, introductory stereochemistry, introduction to chemical reactions and chemical properties of organic compounds.

Practical work: Qualitative and quantitative analysis of appropriate elements and compounds, calorimetry, properties of solutions, electrochemical cells, molecular structure (model-building sessions) synthesis and properties of simple organic compounds.

(CMY 112) First Course in Chemistry 112 (4 lectures + 1 p.)

For Biological Sciences, Home Economics and Dietetics students

(If a student changes from one of these programmes to a BSc programme in Sciences, credit will only be given if a final mark of 60% was achieved)

Theory: General introduction to atoms, molecules, ions, compounds, chemical bonding, reaction equations, chemical equilibrium, acids, bases, reaction kinetics, sediment reactions, colloids and the three phases of matter.

Practical work: Synthesis of simple inorganic compounds and qualitative test for anions and cations.

(CMY 122) General Chemistry 122 (4 lectures +1 p.)

For Biological Sciences, Home Economics and Dietetics students

(If a student changes from one of these programmes to a BSc programme in Sciences, credit will only be given if a final mark of 60% was achieved)

Theory: Electro Chemistry, descriptive inorganic chemistry of certain main group elements. Organic chemistry: Nomenclature, functional groups, isomerism, introduction to typical organic reactions, carbohydrates, lipids, proteins and nucleic acids.

Practical work: Synthesis and characteristics of simple organic compounds

(CMY 282) Physical Chemistry 282 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Classical chemical thermodynamics: Gases. First and Second Law and applications. Physical changes of pure materials and simple compounds. Phase rule. Chemical reactions. Chemical kinetics: Rates of reactions.

Practical work: Chemical reactions.

(CMY 283) Analytical Chemistry 283 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Statistical evaluation of data, gravimetric analysis, aqueous-solution chemistry, chemical equilibrium, precipitation, neutralisation and complex formation titrations, redox titrations, potentiometric methods, introduction to electrochemistry.

Practical work.

(CMY 284) Organic Chemistry 284 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Organic reactivity: Rates and equilibrium. Conjugation and resonance: Allylic systems, aromaticity. Aromatic reactivity: Electrophilic substitution. Carbonyl compounds: Ketones, aldehydes, carboxylic acids and their derivatives. Dynamic stereochemistry: Nucleophilic substitution, elimination, addition. Structure determination: Spectroscopy.

Practical work.

(CMY 285) Inorganic Chemistry 285 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Atomic and molecular structure. Structure of solids (ionic model). Chemistry of main group elements: Elements of groups 15-17. Appearance, chemistry and industrial applications.

Co-ordination chemistry: Terminology. Oxidation states of transition metals. Ligands, co-ordination numbers and stereochemistry. Complexes. Crystal field approach. Applications. Acid base concepts. Oxidants and reductants in water medium.
Practical work.

(CMY 286) Polymer Chemistry 286 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Basic principles of polymer reactions. Polymers: Physical and chemical characteristics. Industrial production of polymers.
Practical work: Experiments illustrating the theory. Projects. Visits to industries.

(CMY 287) Environmental Chemistry 287 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Water resources: surface and subsurface water. Biosystems. Atmospheric Chemistry. Industrial pollution: Solid-state and liquid pollution. Dumping-sites. Water analysis.
Practical work: Experiments based on the theory, simulations of environmental equilibrium systems, projects, visits to water resources, industries and dumping-sites.

(CMY 380) Material Science 380 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Cement, ceramics and pigments: Chemistry and production. Metals: special alloys. Semi-conductors: Chemistry, production and applications.
Practical work: Experiments based on the theory, projects and visits to industries.

(CMY 382) Physical Chemistry 382 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Molecular quantum mechanics. Introduction: Shortcomings of classical physics. Dynamics of microscopic systems. Quantum mechanical principles. Translational, vibrational and rotational movement.

Atomic structure and spectra: Atomic hydrogen. Multiple electron systems. Spectra of complex atoms.

Molecular structure: The hydrogen molecule ion. Diatomic and polyatomic molecules.

Structure and properties of molecules. Molecular spectroscopy: Rotational and vibrational spectra. Electronic spectra. Resonance techniques.

Statistical thermodynamics: Molecular energy levels and the Boltzmann distribution. Canonical ensemble. Statistical entropy. Partition functions. Calculation of thermodynamic properties.

Practical work.

(CMY 383) Analytical Chemistry 383 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Complexometry and complexometric equilibrium. Separation methods: Extraction, Ion exchange. Chromatographic systems. Spectroscopy: Construction of instruments. Atomic absorption and atomic emission spectrometry. Electrochemistry.

Practical work.

(CMY 384) Organic Chemistry 384 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Synthetic methods: Carbon-carbon bond formation. Use of free radicals. Use of carbanions. Conjugate addition reactions. Cycloaddition reactions. Rearrangements. Synthetic planning. Aromatic chemistry: Nucleophilic aromatic substitution.

Heterocyclic Chemistry: Nomenclature. Structure, synthesis and chemistry of sulphur-, nitrogen- and oxygen-containing ring compounds.

Practical work.

(CMY 385) Inorganic Chemistry 385 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Structure and bonding in inorganic chemistry: Molecular orbital approach. Diatomic and polyatomic molecules. Three-centre bonds. Metal-metal bonds. Transition metal complexes. Magnetic properties. Electronic spectra. Reactivity and reaction mechanisms: Reaction types. Introduction to Organometallic chemistry. Special topics. Practical work.

(CMY 386) Chemical Process Technology 386 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Principles of chemical process technology. Flow diagrams, mass and energy balances. Momentum transfer. Heat transfer. Mass transfer. Reactor types. Distillation. Extraction and flotation. Microbiological processes. Process control. Formulation chemistry. Practical work: Projects, visits to industries.

(CMY 388) Chemometrics 388 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Statistical processing of data. Regression and correlation. Factor analysis. Experimental design, interaction. Optimisation techniques. Reporting. Accessing of chemical literature: standard sources, patents. Practical work: Introduction to BASIC. Use of software: word processing, computer algebra, worksheet, graphics.

(CMY 389) Chemical Analysis 389 (4 lectures, 1x6 hours p.) (7 weeks) (7 credits)

Automation and automated process control, application of complexometric reactions, advanced UV/visible spectrometry, X-ray fluorescence spectrometry, molecular fluorescence, phosphorescence and chemiluminescence. Practical laboratory work.

DEPARTMENT OF PHYSICS

(SCI 150) Sciences 150 (5 lectures)

Chemistry: Descriptive Inorganic Chemistry; characteristics and structure of matter, chemical compounds, chemical equations, radioactivity, gaseous state, oxidation, water and watery solutions, acids and bases, salts. (3 lectures per week)

Physics: History of mechanics and electricity. Use of mathematics in physics. Kinematics of a particle with constant acceleration. The concept of a force. Newton's laws of motion. (2 lectures per week)

(SCI 160) Sciences 160 (5 lectures)

Chemistry: Introductory Organic Chemistry. Theory: Constitution, functional groups and classes of organic compounds, aromatic and heterocyclical compounds, macro molecules, carbohydrates, lipide, proteins, enzymes and nucleic acids. (3 lectures per week)

Physics: Equilibrium of a particle and a fixed body. Moment of a force. Work, energy and power. Momentum. Theory of heat. Electricity. (2 lectures per week)

(PHY 113) Exploring the Universe 113 (2 lectures + one double practical session (2 X 50 minutes) every second week) This course is presented in English only.

General introduction to astrophysics, astronomy and cosmology and as such is suitable for students of all faculties. The following topics are covered: the changing perception of the universe over the past millennia; the description of celestial objects such as planets, stars,

the interstellar space, our galaxy and other galaxies, and the cosmic ladder; the origin and the evolution of the universe; the probability of extraterrestrial life and efforts to search for it.

(SCI 121) Astronomy 121 (3 lectures) (14 weeks)

(This course is presented in English only.)

Concepts discussed qualitatively in PHY 113 are treated quantitatively. Prospective students must have had exposure to at least one semester university mathematics and must have thoroughly mastered the school background of physics. One semester of physics at university level is strongly recommended. Spherical trigonometry, co-ordinate systems, luminosity, intensity and the inverse square law of radiation, Pogson's law, Keplerian orbits, Newton's laws, synodic and sidereal periods, Stefan-Boltzmann law, size of stars, binaries and masses of stars, temperature of planets, Doppler shifts, solar and lunar eclipses, the saros and the regression of nodes.

(PHY 101) General Physics 101 (4 lectures + 1 p. + 2 Gold Fields computer sessions or tutorials) *capita selecta* of PHY 171

This is an extended and enriched version of PHY 131. Enrichment includes computer based modules and selected experiments. Vectors, statics, dynamics, work and energy, theory of sound, theory of heat, hydrostatics, hydrodynamics, diffusion, electrostatics, direct current, magnetism, alternating current, optics, atom physics, radioactivity.

(PHY 102) Mechanics and Electricity 102 (4 lectures + 1 p. + 2 tutorials)

capita selecta of PHY 171. This course follows after PHY 101.

Kinematics of a point. Relativistic kinematics, dynamics of particles, rotation and dynamics of fixed bodies, simple harmonic movements, electrostatics, electrodynamics, elementary theory of alternating current.

(PHY 171) First course in Physics 171 (4 lectures + 1 p.) (28 Weeks)

Mathematical introduction; kinematics of a point; dynamics of a particle; rotation, simple harmonic motion; waves; sound; electrostatics; electrodynamics; direct current circuits and instruments; magnetism, induction, geometrical optics.

The course is intended for students in the physical and mathematical sciences.

(PHY 181) General Physics 181 (4 lectures, 1p. (22 credits)

Sem. 1: Units, vectors, one-dimensional kinematics, dynamics, work, balance, sound, fluids, heat, electricals poytential and capacitance, optics, radio-activity.

Sem. 2: Two-dimensional kinematics, rotation movement, fibration and waves, the law of Gauss, circuits, magnetism, radiation.

(PHY 131) General Physics 131 (4 lectures + 1 p.)

Mechanics, heat, electromagnetism, optics and modern physics.

(PHY 216) General Physics 216 (4 lectures + 2 tutorials + 1 p.)

Heat and Thermodynamics: Equations of state, laws of thermodynamics, kinetic molecular theory, Van der Waalsgas, enthalpy, Carnot cycle, heat engines, entropy, thermodynamic potentials.

Electrodynamics: Magnetism in matter, Maxwell's equations.

Physical Optics: Electromagnetic waves, dispersion, Fresnel equations, interference, diffraction.

Special Relativity theory: Einstein's postulates, coincidence of events, time dilation and length contraction, momentum and energy.

Quantum Physics: Wave particle duality, Heisenberg's uncertainty principle, Bohr model, Schrödinger equation in one dimension with piece-wise constant potentials, quantisation of energy and angular momentum, hydrogen atom, spin and exclusion principle.

Nuclear Physics: Nuclear forces, nuclear structure, radioactive decay.

Particle Physics and Cosmology: Elementary particles, laws of conservation, expanding universe.

(PHY 225) Classical Mechanics 225 (2 lectures + 1 tutorial + ½ p.)

Conservative forces, symmetrical motion, damping and periodical forces, laws of preservation, projectile movement, central force fields, planetary movement, rotating axial system, free path length, dispersal, multi-body problems, rigid bodies, elastic and rigid collisions.

(PHY 226) Electromagnetism 226 (2 lectures + 1 tutorial + ½ p.)

Law of Coulomb, electrical field, Law of Gauss, capacitance, magnetism, magnetic induction, inductance, alternating currents, equations of Maxwell, transmission lines.

(PHY 316) Physics 316 (3 lectures) (14 weeks)

Quantum mechanics: Wave function, probability interpretation, expectation values, Schrödinger equation, postulates of quantum mechanics, matrix formalism, momentum representation, applications.

Modelling: Numerical solutions and simulations.

Solid State Physics: Crystallography, diffraction, lattice vibrations, free electrons in metal, band theory, superconductivity.

Optics: Lasers, Fourier optics, holography.

(PHY 317) and (PHY 327) Physics Project 317 and 327 (3 p.each)

It is expected of the student to complete a project under the guidance of the lecturer. The nature of the project is determined jointly by the student, the lecturer and the Head of the Department.

Requirements: Admission only with permission from the Head of Department and the lecturer involved.

NB: PHY 317 and PHY 327 cannot be used as substitutes for other Physics courses at 300 level to obtain admission to the course BSc(Hons) in Physics.

(PHY 329) Applied and Statistical Physics 329 (4 lectures + 2 discussion sessions + 1 p.)

Renewable energy: Sources, solar radiation, equivalent black body, beam and diffuse radiation, spectrally selective surfaces, greenhouse effects, ideal concentrators, edge ray principle.

Electronics: Properties of semiconductor materials, diodes, transistors, transistor amplifiers, operational amplifiers, logic circuitry.

Physics of materials: Diffusion, phase diagrams, vacuum processing, materials properties, materials characterisation, thin film fabrication, novel materials, nanostructures.

DEPARTMENT OF GEOGRAPHY

(GGY 151) Society and Space 151 (4 lectures)

Introduction to geography, environment and humanity, population and space, nutrition and health, geography and inequality, landscape and culture, economic and political imprint.

Geography of tourism: conceptualisation, basic elements, classification, international and South African context. Ecotourism : resources, environmental impact. Case studies.

(GGY 132) Cartographic Skills 132 (1 p.)

Map reading, analysis and interpretation, introductory survey techniques.

(GGY 161) Physical Geography 161 (2 lectures)

Introduction to Earth surface processes, including geomorphical aspects of fluvial systems and slope processes. Introductory Biogeography, the ecological resource base, humans as agents in the ecosphere, and resource conservation. Interactions in and management of the physical environment.

(GGY 162) Remote Sensing 162 (1 p.)

Use, interpretation and analysis of aerial photographs, satellite images and other remotely sensed data.

(GGY 251) Raster GIS 251 (2 lectures + 1 p.)

An introduction to Geographic Information Systems (GIS), types of GIS, data input, data analysis, data output and associated technology. Applications are investigated using a raster-based GIS.

(GGY 252) Process Geomorphology 252 (2 lectures + 1 p.)

Physical processes actively influencing the Earth's surface and their management. Specific processes and their interaction in themes such as weathering, soil erosion, slope, mass movement and fluvial processes.

(GGY 261) Urban Geography 261 (4 lectures)

Urbanisation, settlement systems, social structure, urban morphology, patterns and trends of urban behaviour, management of urban environments, development and the distribution of welfare.

(GGY 262) Spatial and Environmental Analysis 262 (2 p.)

Presentation skills, geographic communication, analysis and statistical interpretation of spatial data.

(GGY 351) Geography of Development 351 (4 lectures)

Theoretical and spatial perspectives on development. Any one of the following: land tenure reform, means of development, regional development.

(GGY 352) Site Evaluation 352 (2 p.)

General principles of site evaluation; evaluation of the suitability of natural and human environments for specific activities.

(GGY 361) Environmental Geomorphology 361 (2 lectures + 1 p.)

Interactions of geomorphic processes with the physical and built environments; themes such as weathering in urban environments, preservation of buildings, deterioration and preservation of indigenous rock art, geomorphology and environmental change, soil erosion and conservation and geomorphic risks and hazards.

(GGY 362) Natural Resource Management 362 (2 lectures + 1 p.)

The biosphere as an environmental system, environmental degradation due to human mismanagement, principles and approaches to sustainable resource management,

ecosystem management in South Africa, solutions to the environmental crisis, approaches to terrain potential and impact assessment.

COURSES FOR THE BSc IN GEO-INFORMATICS

(ABK 310) Earth Science 310 (3 lecture + 1 p.)

Spherical trigonometry, the shape of the earth, ellipsoids, geographical calculations. Map projections and projection mathematics. Global positioning systems.

(GMA 220) Remote Sensing 220 (3 lectures + 1 p.)

The electro-magnetic spectrum, vertical aerial photographs, satellite images, stereo images and image interpretation. Mosaics. Image corrections, image improvement, false colours and geographic references. Ortho-photographs, analogue and digital. Satellite maps.

(GMA 310) Remote Sensing 310 (3 lectures + 1 p.)

Stereo photograph mapping. Advanced image processing techniques. Interpretation and manipulation of remote sensing images and digital photography.

(GMA 320) Remote Sensing 320 (3 lectures + 1 p.)

The advanced theory and implementation of remote sensing in meteorology, oceanography, vegetation analysis and biogeography. Political, commercial and operational aspects of remote sensing for the future.

(GMC 110) Cartography 110 (3 lectures)

A review of the development of cartography, the concepts, processes, techniques and data sources. The role of cartography in digital mapping and geographic information systems.

(GMC 210) Cartography 210 (3 lectures, 1 p.)

Graphic communication rules and the display of spatial data. The cartographic process: necessity, data sources, evaluation, scale, reference base, projection, design specifications, compilation, production and final delivery. Graphic elements of design and symbolisation and implementation of spatially referred data in sociological, economic, topographical and environmental fields.

(GMC 310) Cartography 310 (3 lectures, 1 p.) (From 2001)

The traditional and digital approaches to cartography design, production methods and user/supplier requirements. Evaluation of the cartographic processes for applicability. The functionality of digital mapping programmes and the cartographic software of the geographic information system.

(GMC 320) Cartography 320 (3 lectures, 1 p.) (From 2001)

The cognitive processes of spatial data acquisition and present techniques for visualising spatial data. Knowledge-bases map design techniques. Multimedia and fact related visualising techniques.

(GMT 320) Geomatics Project 320 (1 lectures, 2 p.)

A project approved by the lecturer and in which one or more of the studies techniques of data collecting and processing are used to deliver a product from which spatially referred information can be gleaned. The project must be written up fully in a report.

(SUR 220) Surveying 220 (3 lectures, 1 p.)

Adjustment and use of the following instruments: level, compass and theodolite. Simple site surveying and levelling, tacheometry. Definition of surveying. Co-ordinate systems and direction angles. Connections and polars. Methods for fixing points. Trigonometric height determination.

(SUR 320) Surveying 320 (3 lectures, 1 p.)

The surveying of a control network. Finalising survey networks. Precision surveying, horizontal and vertical. Computer survey packages.

(GIS 210) Geographical Data Analysis 210 (3 lectures, 1 p.)

The gathering, management, analysis and presentation of geographical data. Data sample tests and preparation, geographical references, interpolation, data integration, map presentation and data analysis.

(GIS 310) Geographical Information Systems 310 (3 lectures and 1 p.)

Advanced theory and practice of geographical information systems. Review of the variety of GIS application. Development and implementation of GIS applications.

(GIS 320) Spatial Analysis 320 (3 lectures, 1 p.)

Introduction to a range of spatial analysis techniques, including classification, interpolation, extrapolation, georeference, topology, visualisation, networks, spatial interaction and statistics, and general spatial system analysis.

DEPARTMENT OF COMPUTER SCIENCE

(CIL 171, 172, 173) Computer and Information Literacy (2 credits each)

Offered by the Damilin Computer School on the main campus.

(COS 160) Computer Science 160 (6 credits)

(Can only be taken with the approval of the Head of Department)

Practical introduction to microcomputer software and hardware. Introduction to program design; building blocks for program design; development of elementary algorithms.

(COS 110) Program Design: Introduction 110 (4 lectures + 1 practical)

Program design: design of correct, intelligible, maintainable and efficient programs; usage of object-oriented design principles and programming languages. Computer literacy: the manner in which data is stored and manipulated in a computer; operating systems; a representation and analysis of algorithms; a synopsis of programming languages.

(COS 212) Data Structures and Algorithms 212 (2 lectures + 1 practical)

Analysis of efficiency (time and space) of algorithms that manipulate data structures. Formal specifications, representation and implementation techniques for the following: stacks, lists, trees, graphs, collections, strings and data structures on which sorting is based, criteria which influence the choice of data structures for applications. Programming language C++.

(COS 213) Advanced Programming 213 (2 lectures + 1 practical)

Advanced programming skills on the basis of C++. Other programming methods are also studied.

(COS 221) Databases 221(2 lectures + 1 practical)

Introduction, database management systems and design according to the entity-relationship model. Relation database systems. Aspects of distributed databases and database tendencies. Object-oriented approach to databases.

(COS 222) Operating Systems 222 (2 lectures + 1 practical)

Considerations in design and implementation of the following broad functional areas of a UNIX operating system: process management; importing and exporting; memory and file management.

(COS 283) System Integration 283 (2 lectures + 1 x 3 hour practical)

An introduction to computer networks: network protocols, network topologies, especially LAN and Internet protocols focusing on the use of Java for WWW and network programming. Configuring and optimising a computer for different operating systems (Linux, Windows). Hardware and software upgrading. Trouble-shooting and basic machine maintenance.

(COS 284) Computer architecture 284 (2 lectures + 1 x 3 hour practical)

Intel architecture: design and operation. Assembler code, interrupts, types of memory, physical file handling, device drivers. Overview of RISC architecture

(COS 301) Software Engineering 301 (1 lecture + ½ practical)

Models for Software Engineering, tools and methods for the specification of needs (data flow model etc.), object-oriented design, online systems, testing methods, project planning, configuration management, quality control, Software Engineering design environments.

(COS 314) Artificial Intelligence 314 (2 lectures + 1 practical)

Expert systems as medium to illustrate key AI concepts. Application, development and development tools for expert systems, knowledge acquisition and machine learning, artificial neural networks.

(COS 324) Concurrent and Distributed Systems 324 (2 lectures + 1 practical)

Design constructs for concurrent programming, correctness properties (safety and liveness), notation for specifying models for distributed programming, synopsis of concurrent programming languages, distributed mutual exclusivity, synchronisation, threads, fault tolerance, file systems. Communication in distributed systems.

(COS 332) Computer Networks 332 (2 lectures + 1 practical)

Terminology of communication systems, hierarchy of protocols according to ISO model, applications to communication systems, high-speed networks, ISDN and distributed systems.

(COS 333) Programming Languages 333 (2 lectures + 1 practical)

Generations and levels of programming languages; assembler language; general principles and comparison of programming languages; specific paradigms i.r.o programming languages as functional, logical, object-oriented and concurrent programming languages.

(COS 341) Compiler Construction 341 (2 lectures + 1 practical)

Models for syntax and semantics, regular expressions, finite automata, context-free grammars, guidelines for the design of a programming language, the structure and functionality of a translator, scanning, recognition techniques, semantic analysis; code development, error tracing and recovery.

(COS 343) Trends in Information Technology 343 (2 lectures + 1 practical)

New developments in computer science, including: graphics, Web programming, multimedia, computer laws and ethics.

(INL 111) Information Science 111: Introduction to Information Science (3 lectures + .5 h p. - 7 weeks)

(INL 112) Information Science 112: The lifecycle of information (3 lectures + .5 h p. - 7 weeks)

(INL 211) Information Science 211 (3 lectures + 1 x 3 h p. - 7 weeks)

(INL 212) Information Retrieval 212 (3 lectures + 1 x 3 h p. - 7 weeks)

(INL 221) Information Economics 221 (3 lectures + 1 x 3 h p. - 7 weeks)

(INL 311) Information Science 311 (3 lectures + 1 x 3 h p. - 7 weeks)

(INL 321) Information Science 321 (3 lectures + 1 x 3 h p. - 7 weeks)

(INY 311) Multimedia 311 (3 lectures + 1 x 3 h p. - 7 weeks)

(INY 325) Interface Design 325 (3 lectures + 1 x 3 h p. - 7 weeks)

(INY 326) Mark-up Languages 326 (3 lectures + 1 x 3 h p. - 7 weeks)

Department Information Science, see Faculty of Humanities.

(INF 153) Informatics 153 (2 lectures + 2 x 1 h p. - 14 weeks)

(INF 163) Informatics 163 (2 lectures + 2 x 1 h p. - 14 weeks)

(INF 251) Informatics 251 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 252) Informatics 252 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 261) Informatics 261 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 253) Informatics 253 (2 lectures + 2 x 1 h p. + 1 practice class 1of h - 14 weeks)

(INF 263) Informatics 263 (2 lectures + 2 x 1 h p. + 1 practice class of 1 h - 14 weeks)

(INF 353) Informatics 353 (2 lectures + 2 x 1 h p. - 14 weeks)

(INF 354) Informatics 261 (2 lectures + 2 x 1 h p. - 14 weeks)

(INF 351) Informatics 351 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 352) Informatics 352 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 363) Informatics 363 (2 lectures + 2 x 1 h p. - 14 weeks)

(INF 361) Informatics 361 (3 lectures + 2 x 1 h p. - 7 weeks)

(INF 362) Informatics 362 (3 lectures + 2 x 1 h p. - 7 weeks)

Department Informatics, see Faculty Economic and Management Sciences.

Syllabi: Information Technology

(INF 781) Information Security 781

Principles of security, analysis of threats, determination of assets which need to be protected, cost-effectiveness of techniques.

(INF 782) Electronic Trade 782

Electronic data exchange (EDI), trade on the Internet, electronic payment systems, virtual organisations.

(INF 783) Computer-supported work 783

Decision-making support systems, support of group and co-operative work.

(INF 785) Advanced Database development and administration 785

Database design, database management, database architecture, new application.

(INF 787) Project and end-use management 787

Details from Department Informatics.

(INY 701) Information Management 701

The chief information officer, information imaging as one instrument of information management in organisations, information auditing in organisations.

(INY 702) Information Retrieval 702

Document retrieval systems, the Internet, retrieval of information from the Internet, creating products for the WWW.

(INY 703) Multimedia 703

Details available from Department Information Science.

(GRF 780) Graphics 780

(KMI 780) Artificial Intelligence 780

(PIN 780) Programme Engineering 780

(RNW 780) Networks 780

(VRS 780) Dispersed Computer Systems 780

GOLD FIELDS COMPUTER CENTRE FOR EDUCATION

(SCI 152) Computer and problem-solving skills 152 (2 l. + 2 p. van 2 hour p.w. ,14 weeks) (6 credits)

Computer literacy; administrative computer use; critical mind skills, mathematical problem solving with LOGO.

(SCI 153) Academic Proficiency153 (1 l. per week, 7 weeks) (2 credits)

Aims, time management, taking notes, mind charts, examination skills.

(SCI 162) Computer and problem-solving Skills 162 (2 l. + 1 p. van 2 hour p. week, 14 weeks) (6 credits)

Systems dynamics; computer modelling of dynamic elementary systems.

(SCI 163) Basic research skills 163 (1 l. p. week, 7 weeks) (2 credits)

Scientific findings; the scientific method; scientific publications; scientific ethics.

BSc Extended programme

(EON 151) Basic Language Skills 151 (2 l.p.w., 7 weeks) (2 credits)

Knowledge of basic grammar and basic vocabulary is revised, using documentary texts that are thematically subject related. In terms of skills the focus is placed on the development of receptive skills (listening and reading) on text level, while the development of the productive skills (speaking and writing) will also receive attention, but only on paragraph level.

(EON 152) Basic Language Skills 152 (2 l.p.w., 7 weeks) (2 credits)

Knowledge of general academic vocabulary is developed by means of general academic texts, that are thematically subject related. A foundation is laid in the knowledge of text, grammar and argumentation forms. All four the linguistic skills (listening, reading, speaking and writing) are practised on text level.

(EON 153) Basic Language Skills 153 (2 l.p.w., 7 weeks) (2 credits)

Knowledge of subject specific vocabulary is developed, using subject-specific academic and scientific texts. Basic knowledge of text, grammar and argumentation forms is broadened.

Specific attention is given to the application of the two receptive skills (listening and reading) for academic purposes.

(EON 154) Basic Language Skills 154 (2 l.p.w., 7 weeks) (2 credits)

The focus is on developing and applying the four linguistic skills on text level for academic purposes. The two productive skills (speaking and writing) will receive special attention.

DEPARTMENT OF STATISTICS

(WST 151) Mathematical Statistics 151 (4 l.p.w. + 3 hours p.p.w.) (½ Semester credit)

Sampling methods. Exploratory data analysis. Classification of data, graphical representations, elementary descriptive measures. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 152) Mathematical Statistics 152 (4 l.p.w. + 3 hours p.p.w.) (½ Semester credit)

More advanced descriptive methods. Probability calculation. Introductory distribution theory and statistical inference: Point and interval estimation. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 161) Mathematical Statistics 161 (4 l.p.w. + 3 hours p.p.w.) (½ Semester credit)

Statistical inference: Hypothesis testing with applications in one and two-sample cases. Analysis of variance. Distribution-free methods. Indexes. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 162) Mathematical Statistics 162 (4 l.p.w. + 3 hours p.p.w.) (½ Semester credit)

Curve fitting. Time series analysis. Statistical inference: Correlation and regression. Introductory categorical data analysis. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. Report writing.

(WST 210) Mathematical Statistics 210 (4 l.p.w. + 6 hours p.p.w.) (1 Semester credit)

Set theory. Probability theory. Random variables. Special distributions: Bernoulli, binomial, hypergeometric, geometric, negative binomial, Poisson, uniform, gamma, exponential and normal. Joint distributions. Independent random variables. Conditional distributions. Bivariate normal distribution. Functions and transformations of random variables. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 220) Mathematical Statistics 220 (4 l.p.w. + 6 hours p.p.w.) (1 Semester credit)

Limit distributions and the central limit theorem. Sampling distribution: chi-square, t, beta and F-Point estimation. Interval estimation. Tests of hypotheses. Multivariate normal distribution. Linear regression. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 310) Mathematical Statistics 310 (4 l.p.w. + 6 hours p.p.w.) (1 Semester credit)

Matrix methods in Statistics: generalised inverses, vector spaces and projections. Multivariate statistical distributions: moment generating functions, multivariate normal distribution, conditional distributions, quadratic forms, discrete multivariate distributions. The linear model: theoretical model, estimation of linear functions, generalised t- and F-tests, linear regression, analysis of variance. Regression analysis: single and multiple regression, residual analysis, analysis of variance, selection methods, dummy variables. Identification,

use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 361) Mathematical Statistics 361 (2l p.w. + 3 hours p.p.w. (½ Semester credit)

Estimation and test theory: methods of obtaining estimators and properties of estimators. Uniformly most powerful tests and the maximum likelihood criterion with applications. Design of experiments. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(WST 362) Mathematical Statistics 362 (2 l.p.w. + 3 hours p.,p.w. (½ Semester credit)

Distribution-free methods: one, two and multi-sample rank tests. Linear rank test statistics with applications Rank correlation. Asymptotic relative efficiency. Student seminars. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.

(STK 353) Statistical Analysis of Survey Data 353 - 2 l.p.w. + 1½ hour p.p.w. (½ Semester credit) .

Sample test: Basic technique in probability, improbability and complex sample testing. Analysis of categorical data: Multinomial sample testing, Pearson chi-quadrante statistics, Wald chi-quadrante statistics, loglinear modelling, logistical regression. Re-testing sample testing methods.

(See Faculty of Economic and Management Sciences Yearbook.)

DEPARTMENT OF MATHEMATICS AND APPLIED MATHEMATICS
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(WTW 101) Mathematics 101 (4 lectures + 1 computer session + 1 tutor session)

This course includes the syllabus of Calculus 114, as well as enrichment. Enrichment includes computer based modules.

Real numbers and the co-ordinate plane. Functions and their zeros. Polynomials. Exponential and logarithmic functions. Vector algebra. Limits and continuity. Calculus of single variable functions, rate of change, graph sketching, optimisation and applications. The first mean value theorem. The rule of L'Hospital. The determined and undetermined integral, the main theorem for integrals, the mean value theorem for integrals, integration techniques.

(WTW 102) Mathematics 102 (4 lectures + 2 tutorials + 1 computer session + 1 tutor session)

This course includes the syllabi of Calculus 128 and Linear Algebra 126, as well as enrichment. Enrichment includes computer-based modules. This course is the follow-up to WTW 101.

(WTW 114) Calculus 114 (4 lectures + 1 tutorial of 3 hours)

Vector algebra. Functions, limits and continuity. Differential calculus of single variable functions, rate of change, graph sketching, optimisation and applications. The mean value theorem. The rule of L'Hospital. Definite and indefinite integral, the fundamental theorem of calculus, the mean value theorem for integrals, integration techniques. This course also includes a formal technique mastering programme.

(WTW 115) Discrete Structures 115 (2 lectures + 1 tutorial of 1½ hours)

Propositional logic: truth tables, logical equivalence, implication, arguments. Mathematical induction and well-ordering principle. Counting techniques: elementary probability, multiplication and addition rules, permutations and combinations, binomial theorem, inclusion-exclusion rule.

(WTW 123) Numerical Analysis 123 (2 lectures + 1 tutorial of 1½ hours)

Non-linear equations, numerical integration, initial value problems for differential equations, systems of linear equations.

Algorithms for elementary numerical techniques are derived and implemented in computer programs. Error estimates and convergence results are discussed.

(WTW 126) Linear Algebra 126 (2 lectures + 1 tutorial of 1½ hours)

Matrices and their algebra, systems of linear equations, subspaces of 3^n , bases, determinants. Mathematical induction. Complex numbers and factorisation of polynomials.

(WTW 128) Calculus 128 (2 lectures + 1 tutorial of 1½ hours)

Important inverse functions. Integration techniques, improper integrals, numerical integration, elementary differential equations. Volume and surface areas, arc lengths. Conic sections. Elementary power series and Taylor's theorem. Plane curves, polar coordinates and vector-valued functions.

(WTW 134) Mathematics 134 (4 lectures + 1 tutorial of 2½ hours)

Basic calculus with applications for single variable functions. Discrete probabilities. Matrices.

(WTW 144) Mathematics 144 (4 lectures + 1 tutorial of 2½ hours)

Calculus applications continued. Variance equations and differential equations. Calculus for multi-variable functions. Statistics.

(WTW 152) Mathematical Modelling 152 (2 lectures + 1 tutorial of 1 hour & 30 minutes)

Introduction to modelling of dynamic processes with the aid of differential equations. Continuous dynamical systems. Application to real situation – among other things in finance, economics and ecology.

(WTW 162) Dynamical Processes 162 (2 lectures + 1 tutorial of 1 hour & 30 minutes)

introduction to modelling of dynamic processes with the aid of simple differential equations. Solving methods for differential equations, and analysis of these methods (graphs). Application to true situations, among others in the ecology, economy and finance.

(WTW 211) Linear Algebra 211 (2 lectures + 1 tutorial of 1½ hours)

Matrices and linear equations, linear independence, real vector spaces and sub-spaces, eigenvalues, eigenvectors, diagonalisation of matrices, applications of eigenvalue problems, linear transformations.

(WTW 215) Finite Mathematics 215 (2 lectures and 1 tutorial of 1½ hours)

Propositional logic: Syntax, semantics (tautologies), rules of inference.

Induction and recursion: Relation between induction and recursion; application of induction to loop invariants.

Data collection and survey methods. Frequency tables and graphical representation. Descriptive measures of location and spread. Curve fitting methods, regression and correlation.

(WTW 218) Calculus 218 (2 lectures + 1 tutorial of 1½ hours)

Vector functions and multi-variable functions. Multiple integrals. Line and surface integrals, theorems of Green, Gauss and Stokes. Applications.

(WTW 220) Analysis 220 (2 lectures + 1 tutorial of 1½ hours)

Properties of real numbers. Analysis of sequences and series of real numbers. Power series and theorems of convergence. The Bolzano-Weierstrass theorem and the intermediate value theorem. Analysis of real-valued functions on an interval.

(WTW 221) Linear Algebra 221 (2 lectures + 1 tutorial of 1½ hours)

Change of basis, diagonalisability of linear transformations, orthogonal vectors, unitary and orthogonal transformations, canonical forms, applications.

(WTW 228) Calculus 228 (2 lectures + 1 tutorial of 1½ hours)

Sequences and series. Power series. Fourier series. Applications to differential equations.

(WTW 282) Dynamical Systems 282 (2 lectures + 1 tutorial of 1½ hours)

Systems of differential equations are used to model dynamic real-life situations, for example in ecology and economics. Solution methods for linear systems. Qualitative analysis of linear and non-linear systems: phase portraits, stability of points of equilibrium, modelling in mechanical, electrical and economic systems, introduction to chaotic systems.

(WTW 283) Numerical Analysis 283 (2 lectures + 1 tutorial of 1½ hours)

Numerical integration, initial value problems for differential equations and systems of differential equations (one-step and multi-step methods), systems of non-linear equations. Algorithms for numerical techniques are derived and implemented in computer programs. Error estimates and convergence results are proved.

(WTW 285) Discrete Structures 285 (2 lectures + 1 tutorial of 1½ hours)

Counting techniques: combinations with repetition, functions, Pigeon-hole principle. Countability and computability. Setting up and solving recurrence relations. Graphs: paths, cycles, trees, isomorphism. Graph algorithms: Kruskal, Prim, Fleury, loop invariants.

(WTW 286) Differential Equations 286 (2 lectures + 1 tutorial of 1½ hours)

Theory and solution methods for linear differential equations. Systems of linear differential equations. Solution methods for first order non-linear differential equations. Laplace transform with emphasis on applications.

(WTW 289) Geometry 289 (1 lecture + 1 tutorial of 1 hour)

Parallelism theorems. Vectors: similarities between vector algebra and classical geometry. Congruence and isometric transformations. Similarity of triangles. Properties of circles. Special points in triangles. Collinearity and concurrency: theorems of Menelaus and Ceva with applications.

(WTW 310) Analysis 310 (2 lectures, seminar + 1 tutorial of 1½ hours)

Topology of finite dimensional spaces: Open and closed sets, compactness, connectedness and completeness. Theorems of Bolzano-Weierstrass and Heine-Borel. Analysis of properties of functions. Applications. Integration theory in \mathbb{R}^1 and \mathbb{R}^n : The Riemann-(Stieltjes) integral. Different conditions for integrability.

(WTW 312) Financial Mathematics 312 (2 lectures, seminar and 1 tutorial of 1½ hours)

The basic theory of interest. Fixed income securities. Term structure of interest rates. Interest rate analysis. Actuarial applications.

(WTW 332) Stochastic Processes 332 (2 lectures and 1 tutorial of 1½ hours)

Mathematical formulation of a number of probability models, properties of random variables, theory of Poisson and Markov processes with applications in mathematics of Finance and Engineering.

(WTW 381) Algebra 381 (2 lectures, seminar + 1 tutorial of 1½ hours)

Group theory: Definition, examples, elementary properties, subgroups, permutation groups, isomorphism, order, cyclic groups, homomorphism, factor groups.

Ring theory: Definition, examples, elementary properties, ideals, homomorphism, factor rings, polynomial rings, factorisation of polynomials.

Field extensions, applications to straight-edge and compass constructions.

(WTW 383) Numerical Analysis 383 (2 lectures, seminar + 1 tutorial of 1½ hours)

Direct methods and iterative methods for the solving of linear equations, pivoting, eigenvalues and eigenvectors. Application in boundary value problems and eigenvalue problems for differential equations.

Algorithms for numerical techniques are derived and implemented in computer programs. Complexity of computation is investigated. Error estimates and convergence results are proved.

(WTW 384) Complex Functions 384 (2 lectures, seminar + 1 tutorial of 1½ hours)

Exponential, logarithmic, power and Möbius functions. Cauchy-Riemann equations, Cauchy's theorem and integral formulas, Taylor and Laurent series, residue theorem, calculation of real integrals by means of residues.

(WTW 385) Discrete Structures 385 (2 lectures, seminar + 1 tutorial of 1½ hours)

Basic combinatorial objects: Selections, arrangements, permutations, partitions. Algorithmic generation of combinatorial objects. Generating functions, group actions, Polya-theory.

(WTW 386) Partial Differential Equations 386 (2 lectures, seminar + 1 tutorial of 1½ hours)

Modelling by means of conservation laws. Study of diffusion and wave equations: Construction of solutions; uniqueness; continuous dependency of data. Non-linear equations. Energy and other qualitative methods.

(WTW 389) Geometry 389 (2 lectures, seminar + 1 tutorial of 1½ hours)

Elementary Euclidean geometry. Axiomatic development. The parallel postulate and non-Euclidean geometry. Orthogonal circles and inversion in circles. Cross ratio, harmonic division and perspectivities. Models of different geometries.

COURSES FROM OTHER FACULTIES

(ERR 220) Computers 220

(ERR 320) Computers 320

(CIR 212) Chemical Engineering 212

(CIR 222) Chemical Engineering 222

Consult Faculty of Engineering and The Built Environment.

(FIL 182) Science and World Views 182 (1 lecture p.w.)

(SLK) Psychology

Consult Faculty of Arts.

(SLK) Psychology: Consult Faculty of the Humanities

Zoology and Entomology; Physiology; Genetics; Soil Science; Microbiology and Botany

Consult Faculty of Natural, Agricultural and Information Sciences Part II.

Economics; Financial Accounting; Informatics; Business Management

Consult Faculty of Economic and Management Sciences.

SYLLABI FOR DIPLOMAS

SCIENCE EDUCATION [BSecEd(Sci)]

(SCE 200) Science Education 1 (2 lectures + 1 practical of 1 Hour) (5 credits per sem. = 10)

Themes in education which provide knowledge skills and values of a teacher able to promote a culture of learning:

Didactics: Education models. Outcomes based education. Factors influencing educational communication.

Education Psychology and Theories of Learning: Educational behaviour and psychological life. Home environment of the pupil. The developmental stage of the secondary school child. Theories of learning. Learning and studying. The reflective practitioner.

School Organisation: Classroom management. The educational system in South Africa. Educational law. Discipline and Punishment.

(SCE 300) Science Education 2 (2 lectures + 4 practicals of 1 hour) (8 credits per sem. = 16)

Themes in education which provide the knowledge, skills and values of a teacher able to promote a culture of learning:

Philosophy of education: Theories and nature of learning. Strategies of teaching. Remedial teaching. The reflective practitioner. Curriculum planning and development. Current philosophies of education. Professionalisation and the Trade Union debate.

Educational technology and media: The role of media in teaching: technology, selection and integration.

Educational Communication: The nature of teaching communication. Areas of communication styles, public communication, as well as the relationship between teaching methods and effective communication. Language development. Cultural and gender issues.

Life Orientation and Counselling:

Introduction to the foundations of counselling. A system of guidance (specifically in the secondary school). Some aspects of school guidance. Family guidance, career choice and associated problems. Community and social development, personal and self development, self management. Physical and sexual development. Career planning and development.

Practical: Model school to the equivalent of 1 week teaching practice will be arranged with the Centre for Science education.

(SCE 400) Science Education 3 (4 lectures) (8 credits per sem. = 16)

Themes in education which provide knowledge, skills and values of a teacher able to promote a culture of learning:

History of Education and Comparative Education: Educational themes from a time perspective. Current educational practice. Curriculum planning and development.

Orthopedagogics: Theories on the nature of learning. Categories of learning and behaviour problems. Assessment of learning, methods, instruments and techniques. Manifestation of educational problems and remedial teaching. The reflective practitioner.

Sociology of Education: Contemporary problems experienced by youth, drug abuse, juvenile delinquency, environmental deprivation, youth suicide, anorexia nervosa, child abuse.

(SCE 301) Educational Community Project 301 (10 credits)

Students must demonstrate the ability to facilitate learning with particular emphasis on the application of team teaching, negotiation for resources, planning and implementation. Evaluation includes a dissertation by the student teacher, evaluation reports from a supervisor and participants. Additionally, the student teacher presents a report to peers in the form of a seminar.

This contributes two weeks to Teaching Practice. The project is arranged in cooperation with the Centre for Science Education.

(SCE 302) Teaching Practice 302 (Project) (22 Credits)

Teaching practice will be in the format of a continuous period of 11 weeks in a functioning school.

Support materials demonstrate the possibilities and restrictions of educational technology and provide additional information to stimulate reflection, the cultivation of independent lifelong learning and challenging creativity and thinking skills.

Final assessment of competence is based on a portfolio of artefacts and records of proof of the ability of student teachers to facilitate learning, reasoned arguments to motivate their assessment of their competencies to facilitate learning.

(SCE 402) Teaching Practice 402 (Project) (10 Credits)

Teaching Practice will be in the form of an action research project in a functioning school over a continuous period of 5 weeks.

The aim of the action research project is to analyse and evaluate the promotion of a culture of learning on the macro, meso and micro level in order to improve current practice.

Essay and seminar.

(SCE 170) Religious Education 170 (1 lecture) (2 credits per sem. = 4)

Prominent Religions in South Africa, world views associated with these religions, the cultural role of religions, importance of holy days.

SUBJECT DIDACTICS

Subject Didactics are presented in cooperation with relevant departments.

(SCE 471) Subject Didactics of Biology 471 (2 lectures + 1 practical) (7 credits per sem. = 14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials.

Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance. Laboratory safety and first aid.

Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education.

(SCE 472) Subject Didactics of Geography 472 (2 lectures + 1 practical) (7 credits per sem. = 14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials. Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance.

Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education.

(SCE 473) Subject Didactics of Agricultural Science 473 (2 lectures + 1 practical) (7 credits per sem. = 14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials. Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance. Laboratory safety and first aid.

Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education.

(SCE 474) Subject Didactics of Physical Science 474 (2 lectures + 1 p.) (7 credits per sem. = 14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials. Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance. Laboratory safety and first aid.

Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education..

(SCE 475) Subject Didactics of Computer Studies 475 (2 lectures + 1 p.) (7 credits per sem. = 14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials. Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance.

Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education.

(SCE 476) Subject Didactics of Mathematics 476 (2 lectures + 1 p.) (7 credits per sem. =14)

Nature and structure of the subject. Learning theory and strategies, whole class, group and individual learning. Methods to encourage independent study and a critical reasoning capacity in pupils. Remediation. Interpreting syllabi, negotiation and setting of objectives, evaluation, assessment and reflection. Identification and interpretation of resource materials. Administration and keeping of records, planning and arranging the practical and laboratory-based learning experience. Environmental issues related to the subject. Career guidance. Practical: Model school to the equivalent of one week of teaching practice to be arranged in cooperation with the Centre for Science Education.

FURTHER DIPLOMA IN EDUCATION

SEF 471 Mathematics 471 (56l, 24 h p, 28 hrs of assignments)

Content

Basic Calculus with applications in single-variable systems. Matrices. Discrete and Continuous Probability.

Outcomes

The learner must demonstrate the achievement of the following outcomes:

- Display knowledge of the underlying structure of mathematics and demonstrate the skill to apply this to several situations encountered in the sciences.
- Demonstrate an ability to perform the necessary and relevant manipulations underlying and derived from the fields of algebra, analysis and calculus.
- Demonstrate an ability to apply probabilistic thought to problems in mathematics and the sciences.
- Demonstrate the ability to employ critical and creative thinking in situations of mathematical, scientific and technological nature, in social and economic and entrepreneurial contexts.

SEF 472 First Course in Chemistry 472 (56l, 24 h p, 28 hrs of assignments)

Content

General introduction to atoms, elements, chemical bonding and structure, chemical reactions, reactivity, chemical equilibrium, acids and bases, thermochemistry, electrochemistry, phases of matter, organic bonding, stereochemical aspects, organic reactions of hydrocarbon, alcohols, ethers, thiols, amines, aldehydes, ketones, carboxylic acids and their derivatives, carbohydrates, lipids and proteins.

Practical: Synthesis and properties of simple organic and inorganic compounds.

Outcomes

The learner must demonstrate the achievement of the following outcomes:

- Use of the principles, rules, conventions, theories and models according to which chemical compounds and their structure are described
- Apply basic principles to balancing of equations and calculations
- Apply the principles of Organic Chemistry
- Apply the principles of Biochemistry to describe and explain simple biochemical processes.
- Perform simple chemical experiments successfully, with correct and safe handling of laboratory equipment.
- Communicate effectively in the accepted idiom of the subject Chemistry.
- Problem-solving skills and innovation

SEF 473 General Physics 473 (56l, 24 h p, 28 hrs of assignments)

Content

Units, vectors, one-dimensional kinematics of a point, relativistic kinematics, dynamics, work, equilibrium, sound, liquids, heat, electrical potential and capacitance, optics, radioactivity.

Outcomes

The learner must demonstrate the achievement of the following outcomes:

- Apply the fundamental concepts and principles of the relevant areas of physics to the solution of typical problems of the field.
- Demonstrate the use of measuring instrumentation, perform a critical analysis of the results and report them in an appropriate scientific format.
- Problem solving skills and innovation

SEF 474 Earth Sciences 474 (56l, 24 h p, 28 hrs of assignments)

Content

Geology and its subsections: the earth as part of the universe; geological time, the development of the theory of plate tectonics; the chemical composition of the earth. External geological processes; the land surface system; the geological work of gravity, running and subsurface water, wind, ice, lakes, and the sea; stratigraphical synthesis. Earthquakes and magmatic activity. Introduction to economic geology.

Physical processes that affect the earth's surface and their management. Specific processes and their interaction in themes such as weathering, soil erosion, slope, mass movement and fluvial processes

Outcomes

The learner must demonstrate the achievement of the following outcomes:

- Use process skills to investigate the phenomena associated with the physical environment
- Solve problems in innovative ways, including holistic problems of environmental management and decision making.
- Demonstrate an understanding of the economic, socio-political impacts of the earth sciences and mineral resources in South Africa.
- Demonstrate an understanding of sustainable development of the environment

SEF 475 Mathematics 475 (56l, 24 h p, 28 hrs of assignments)

Content

Propositional logic: Syntax, semantics (tautologies), inference rules. Induction and recursion: Relation between induction and recursion; Application of induction to loop invariants. Obtaining data and sample techniques. Frequency tables and graphical representation. Descriptive measures of location and spread. Curve fitting, regression and correlation. Theorems on parallelism, loci. Vectors, translation between vector algebra and classical geometry. Congruence and isometric transformations. Similarity and homological transformations. Properties of circles. Special points in triangles. Collinearity and concurrency: theorems of Menelaus and Ceva with applications.

Outcomes

The learner must demonstrate the achievement of the following outcomes:

- Mastery and ability to synthesise statements of formal logic.
- Use the principle of mathematical induction in statements concerning series and sequences of integers.
- Model and analyse algorithms and processes
- Obtain, analyse and present data using methods and principles of statistics

- Knowledge and application of principles and theorems of plane geometry of angles, triangles, circles

SEF 481 Current trends in mathematics, science and technology education 481 (28l, 28hrs of assignments)

Content

Notions of excellence in mathematics, science and technology education embedded in the learning area programmes will be explored.

The philosophy and goals of outcomes based education. The specific outcomes in the Natural Sciences, Numeracy and Mathematics, and Technology learning areas. Curriculum development and assessment.

Outcomes

Students must demonstrate the achievement of the following outcomes:

- Display knowledge and evaluate the worth of both international trends and best practice in mathematics, science and technology education and of mathematics, science and technology learning area outcomes of curriculum 2005.
- Design a curriculum unit based on best practice and selected curriculum 2005 outcomes, and incorporating previously unused resources.
- Design assessment criteria and instruments for the curriculum unit.
- Test the curriculum unit, including the assessment component, in a classroom setting and evaluate its strengths and weaknesses.

(SEF 482) Computers in mathematics, science and technology education 482

Content

Basic Internet Skills: The World Wide Web as a source of information and data: Searching the World Wide Web and book marking of sites, Searches of cyberspace for programmes and data, File transfer protocol and obtaining computer and data files from remote sites; Email, Distributed messages; News groups and chat areas; Finding and using graphics. Newest Technology.

Using the Internet in the mathematics, science and technology classroom: Taxonomies of the use of telecommunications in the classroom; Useful sites on the Internet for mathematics, science and technology teachers; Project based teaching; Collaborative projects on the Internet.

Outcomes

Students must demonstrate the achievement of the following outcomes:

- Perform all basic Internet skills listed in the content section above.
- Display knowledge and evaluate the worth of the use of telecommunications in mathematics, science and technology education.
- Design a telecommunications activity that could be used in a mathematics, science and technology curriculum unit based on best practice.
- Test the activity in a classroom setting and evaluate its strengths and weaknesses.

(SEF 483) Computers in mathematics, science and technology education 483

Content

Graphics manipulation, analysis, and visualisation. Design curriculum material that can be placed on the Internet.

Outcomes

Students must demonstrate the achievement of the following outcomes:

- Perform all skills related to graphic manipulation, analysis and visualisation.
- Display knowledge and evaluate the worth of the use of graphics in mathematics, science and technology education.

- Design an activity based on graphic analysis or visualisation that could be used in a mathematics, science or technology curriculum unit based on best practice.
- Test the activity in a classroom setting and evaluate its strengths and weaknesses.
- Design a multimedia presentation as part of the mathematics, science or technology curriculum unit based on best practice.
- Test the presentation in a classroom setting and evaluate its strengths and weaknesses.

(SEF 484) The computer as a laboratory and classroom tool

Content

The use of the computer to collect and analyse data that are collected in the laboratory or in the field. Opportunities for the integration of mathematics, science and technology will be explored.

Mathematics, science and technology oriented software for school use will be demonstrated and evaluated for classroom use and applied appropriately. Software will include: spread sheets, Concept formation, Simulations and Problem Solving. Applications of the above at the primary and secondary levels will be provided. The integration of mathematics, science and technology using problem solving approaches will be emphasised.

Outcomes

Students must demonstrate the achievement of the following outcomes:

- Perform all skills related to the use of laboratory interfaces and probes.
- Display knowledge and evaluate the worth of the use of selected software in mathematics, science and technology education.
- Design an activity based on laboratory interfaces and probes that could be used in a mathematics, science and technology curriculum unit based on best practice.
- Test the activity in a classroom setting and evaluate its strengths and weaknesses.
- Design a lesson that incorporates software as part of the mathematics, science and technology curriculum unit based on best practice.
- Test the lesson in a classroom setting and evaluate its strengths and weaknesses.

(SEF 485) Networking software and hardware 485

Content

The setting up of a local area network (LAN) and provision of an Internet Gateway. Various networking options will be explored, and the appropriate software and hardware demonstrated. The definition of the need and capacity, matching of networking systems to the needs and resources of a school, and identifying an appropriate choice of technology. The role of basic and Value-added service providers. Obtaining appropriate services.

Outcomes

Students must demonstrate the achievement of the following outcomes:

- Specify and set up a typical school-based network consisting of a file-server, networked workstations, and a telecommunications link. The set up will include the installation of all relevant software programmes.
- Analyse and solve real or simulated problems on the network.

(RTS 410) Computer Assisted Testing 410 (28L)

Refer to the yearbook of the Faculty of Education.

Development and implementation of computer assisted tests. Management issues associated with computer assisted testing

Types of questions, feedback and remediation.

Postgraduate Diploma in Earth Science
(See Syllabi for Master's studies)

Postgraduate Diploma in Environment and Society
(See Syllabi for Master Studies)

POST GRADUATE STUDIES

HONOURS DEGREES

Sc.10 BACCALAUREUS SCIENTIAE HONORES [BSc (Hons)]

Also consult General Regulations G.1.3, G.16 and G.62, postgraduate Syllabi.

(a) Admission requirements

(i) For the BSc(Hons) degree

Subject to the stipulations of General Reg. G.16, a student is only admitted to the study for the honours degree if he or she holds the BSc or BSecEd(Sci) degree and provided that he or she complies with the stipulations for the particular courses as set out in the syllabi descriptions.

(ii) For the BSc(Hons) degree in Applied Science

An approved B Tech, BSc or BIng or equivalent qualification. Candidates who do not have a matriculation exemption certificate, have to apply for such a certificate on the grounds of a BTech degree.

(iii) Subject to the approval of the Head of Department, a student may report for the examination for the BSc(Hons) degree after at least one year of full-time study .

(i) The curriculum is compiled in consultation with the Head of Department, from whom full details may be obtained.

(ii) In cases where the required subject or linguistic basis is lacking, additional courses may be prescribed

(b) Pass requirements

For more information consult Postgraduate Syllabi.

For preparation, evaluation and examination of projects, consult the manual of the Faculty, which is obtainable on request from the Head of Department. The pass mark for essays is at least 50%. The stipulations regarding pass requirements for dissertations in General Regulation G.60.2.1 2(a) apply *mutatis mutandis* to essays.

(c) Degree with distinction

To pass with distinction, a student must obtain an average of at least 75% in the examination as a whole.

(d) Degrees		
Department	Degree code	Courses and Codes
Chemistry	02240121	Details obtainable from the
(Applied Sciences)	02240122	Head of the Department
Computer Science	02240081	Details obtainable from the
		Head of the Department
Earth Sciences		
(i) Geology	02240141	Geology 700, GLG 700
(ii) Exploration Geophysics	02240351	Exploration Geophysics 700, EGF 700
(iii) Engineering Geology	02240371	See Postgraduate Syllabi
(iv) Meteorology	02240070	See Postgraduate Syllabi
Geography		
(i) Ecotourism	02240410}	
(ii) Geography	02240411}	
(iii) Environmental Analysis and Management	02240412}	See Postgraduate Syllabi
(iv) Geographic Information Systems (GIS) (Distance Education)	02240409}	
Geo-informatics	02240408	See Postgraduate Syllabi
Mathematics and Applied Mathematics		
(i) Applied Mathematics	02240171}	
(ii) Mathematics	02240181}	Details obtainable from the
(iii) Mathematics of Finance	02240272}	Head of the Department
(iv) Mathematics Education	02240271}	
Physics	02240231	Details obtainable from the
		Head of the Department
Statistics		
Mathematical Statistics	02240191	Details obtainable from the
		Head of the Department
Applied Sciences	02240441	Details obtainable from the
		Head of the Department

MASTER'S DEGREES

Sc.11(a) MAGISTER SCIENTIAE (MSc)
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Also consult the General Regulations G.1.3, G.30, G.32 and G.62.

(a) Admission

(i) MSc degree

Subject to the stipulations of General Reg. G.1.3, G.30 and G.62, the BSc(Hons) degree is required for admission.

(ii) **MSc degree in Applied Sciences**

BSc(Hons) degree in Applied Sciences or an equivalent qualification, in which case the candidate has to prove that he or she has achieved the standard of a BSc(Hons) in Applied Sciences.

Further requirements for admission, if any, are indicated in the syllabi of the various Departments.

- (iii) Where admission to the study for the MSc degree does not follow after a BSc(Hons) degree, the minimum period of study for the MSc degree will be two years.

(b) Conferring of degree

The MSc degree is conferred by virtue of a dissertation and such additional postgraduate course work as may be prescribed. Additional postgraduate course work will be compulsory in cases where the BSc(Hons) degree is not a requirement for admission to the study for the MSc degree.

(c) Pass requirements

(i) A pass mark of at least 50% must be obtained in both the dissertation and in the additional prescribed course work, if such additional course work is prescribed.

(ii) For preparation, evaluation and examination of essays, consult the manual of the Faculty, which is obtainable on request from the Heads of Departments. The minimum pass mark for essays is 50%. The stipulations regarding pass requirements for dissertations in regulation G.60.2.1.2(a) apply *mutatis mutandis* to essays.

(d) Degree with distinction

The degree is conferred with distinction on a student who obtains a final mark of at least 75%.

(e) Degrees

Department	Degree Code	Courses and codes
Chemistry (Applied Sciences)	02250121}	Chemistry 800 – CHM 800
	02250122}	Dissertation: Chemistry CHM 890
Computer Science	02250081	Computer Science 800 – RKW 800 Dissertation: Computer Science – RKW 890
Geography	02250411	Geography 800 – GGF 800 Dissertation: Geography - GGF 890
Geo-informatics	02250412	See syllabi for postgraduate studies
Earth Sciences		
(i) Geology	02250141	Dissertation: Geology –GLG 890
(ii) Exploration Geophysics	02250431	Dissertation: Exploration Geophysics – EGF 890
(iii) Engineering Geology	02250371	Dissertation: Engineering Geology – IGL 890
(iv) Applied Mineralogy	02250381	Dissertation: Applied Mineralogy – TMN 890

(v) Meteorology 02250070 Dissertation: Meteorology – AWM 890
Exam: Meteorology - AWM 800
Theory & an Essay

(vi) Earth Science Practice and Management 02250072 See Postgraduate Syllabi

Mathematics and Applied Mathematics

(i) Applied Mathematics 02250171 For compulsory courses: consult Head of Department.
Dissertation: Applied Mathematics-
TWS 890

(ii) Mathematics 02250181 For compulsory courses: consult Head of Department.
Dissertation: Mathematics – WIS 890

(iii) Mathematics of Finance 02250182 For compulsory courses, consult Head of Department. Dissertation: Mathematics of Finance (WTW 890)

(iv) Mathematics Education 02250183 For compulsory courses, consult Head of Department. Dissertation: Mathematics Education (WTW 890)

Physics 02250231 Dissertation: (PHY 890)

Statistics

(i) Applied Statistics 02250401 Applied Statistics 800 – TST 800
Dissertation: Applied Statistics – TST 890

(ii) Mathematical Statistics 02250191 Mathematical Statistics 800 – WST 800
Dissertation: Mathematical Statistics – WST 890

Environment and Society 02230410 Consult postgraduate syllabi

Science Education 02250442 Science Education 800 (SCE 800)
Dissertation: Science Education (SCE 890)

Applied Sciences 02230441 Head of Department determines study programme

Sc 11(b) MAGISTER IN INFORMATION TECHNOLOGY (Code 02250082)

See Syllabi for full details.

DOCTORATES

Sc.12 PHILOSOPHIAE DOCTOR

Also consult the General Regulations and Sc.13 for fields of Study.

(iii) **Presentation**

The document submitted for examination must consist of a selection of published articles as well as a motivated representation in which the grounds for submission and coherency of the work presented is evident.

(b) **Degrees**

Department	Degree code		Courses and Codes
	PhD	DSc	
Chemistry (Applied Sciences)	02260451 02230452	02260121	Chemistry 900 - CHM 900 Thesis: Chemistry - CHM 990
Computer Science (Applied Sciences)	02260591 02260592	02260081	Computer Science 900 - RKW 900 Thesis: Computer Science - RKW 990
Geography	02260511	02260411	Geography 900 - GGF 900 Thesis: Geography - GGF 990
Geo-informatics	02260512		Geo-informatics 900 (GIS 900) Thesis: Geo-informatics (GIS 990)
Information Technology	02260593	-	Information Technology 900 (PIT.900) Thesis: Information Technology (PIT 990)
Earth Sciences			
(i) Geology	02260521	02260141	Geology 900 - GLG 900 Thesis: Geology - GLG 990
(ii) Exploration Geophysics	02260531	02260431	Exploration Geophysics 900 - EGF 900 Thesis: Exploration Geophysics - EGF 990
(iii) Engineering Geology	02260541	02260371	Engineering Geology 900 - IGL 900 Thesis: Engineering Geology - IGL 990
(iv) Meteorology	02260630	02260070	Meteorology 900 - AWM 900 Thesis: Meteorology - AWM 990
Mathematics and Applied Mathematics			
(i) Applied Mathematics*	02260621	02260171	Applied Mathematics 900 - TWS 900 Thesis: Applied Mathematics - TWS 990
(ii) Mathematics*	02260651	02260181	Mathematics 900 - WIS 900 Thesis: Mathematics - WIS 990

Physics	02260481	02260231	Physics 900 - FSK 900 Thesis: Physics - FSK 990
Statistics			
(i) Applied Statistics	02260601	02260401	Applied Statistics 900 - TST 900 Thesis: Applied Statistics - TST 990
(ii) Mathematical Statistics	02260611	02260191	Mathematical Statistics 900 - WST 900 Thesis: Mathematical Statistics - WST 990
Science Education	02260752		Science Education 900 - SCE 900 Thesis: Science Education - SCE 990
Applied Sciences	02260751		Details available at applicable Head of Department

NB:

- * Admission: An appropriate Master's degree.
A brochure with details is obtainable from the Head of the Department.

SYLLABI FOR POSTGRADUATE STUDIES

HONOURS DEGREES

BSc(Hons) degree course specialising in Chemistry (Code 02240121)

Admission

An appropriate BSc degree with at least 60% for Chemistry at 300 level.
The course normally extends over one year for full-time students. The curriculum comprises an advanced study of the four major fields of study. Prospective students must apply for admission to the Head of the Department, in writing, before 15 December and will be notified of the outcome by 15 January.

Details regarding the compilation of the course can be obtained from the Head of the Department.

Analytical Chemistry (CMY 710)
Organic Chemistry (CMY 711)
Anorganic Chemistry (CMY 712)
Physical Chemistry (CMY 713)

BSc(Hons) Physics (Code 02240231)

(PHY 700) (270 lectures, advanced experimental work and a seminar)

Admission:

An applicable BSc degree with an average of at least 60 % in Physics at 300 level is required.

The curriculum is compiled in consultation with the Head of Department from whom full details may be obtained.

BSc(Hons) Geography (Code 02240411)

Admission: An appropriate B degree with Geography at 300 level generally with an aggregate of 60%.

BSc(Hons) Ecotourism (Code 02240410)

Admission: An appropriate B degree generally with an aggregate of 60% in final-year courses.

BSc(Hons) Environmental Analysis and Management (Code 02240412)

Admission: An appropriate B degree generally with an aggregate of 60% in final-year courses.

Curriculum: 7 Courses chosen from the following, as well as a research project (GGY 702):

- GGY 710 Geography: ITS Evolution 710
- GGY 711 Environmental Principles 711
- GGY 780 Urbanism in Southern Africa 780
- GGY 781 Geography of Development 781
- GGY 782 Spatial Population Dynamics 782
- GGY 783 Geography and Gender 783
- GGY 784 Geography of Sport & Recreation 784
- GGY 786 Ecological Resource Management 786
- GGY 787 Ecotourism 787
- OMS 789 Environmental Change 789
- GGY 720 Environmental Procedures 720
- OMS 782 Southern African Geomorphology 782
- OMS 783 Polar and Mountain Environments 783
- GGY 701 Selected Theme 701
- GIS 785 GIS for Environmental Sciences 785

BSc(Hons) Geo-informatics (Code 02240408)

Admission

An appropriate B degree generally or any other qualification accepted by the Senate of the University of Pretoria. Preparatory course work may also be required at the discretion of the Head of Department. The student must also be computer literate.

Duration

Two years telematic, but provision has been made for a full time programme over one year.

Curriculum

10 modules selected from the following plus a research project:

(UNI 780) GIS Review 780

An introduction to GIS against the background of the management and use of spatial data. Aspects which are covered include are the basic definition and concepts of GSI, the variety of applications of GIS technology, the potential and value of GIS technology as management tool, and the future of GIS.

(UNI 781) Spatial Data Modelling 781

Aspects covered are the data modelling process and its importance, spatial entity hierarchy, spatial data modelling and structure, raster and vector structures, polygon architecture and the implementation of the data modelling process on geographic problems.

(UNI 782) Spatial Data Modelling 782

Extension of the basic principles of spatial modelling.

(UNI 783) Database Theory 783

Aspects covered included are the data base approach, the relational model, SQL, data modelling techniques, implementation of a data base, object orientated models, spatial data structure, networks and data base problems in GIS.

(UNI) 784) Database Theory 784

extension of the basic principles and methods for geographic database design.

(UNI) 785) Spatial Analysis 785

Aspects covered include calculation of area and circumference, simple and complex inquiries, spatial analysis, modelling, three-dimensional GIS, digital site models and network analysis.

(UNI 786) Spatial Analysis 786

Extension in basic principles and methods of geographic analysis.

(UNI 787) Data Sources 787

The methods and problems of data collection and its integration into GIS, including aspects such as data requirements and limits, sources of GIS data, location and cataloguing of data, data intake, data conversion and the integration of spatial data.

(UNI 788) Data Quality 788

The characteristics of data quality and its implications for decision making and problem solving. Aspects included are problems and elements of data quality, causes of faults and uncertainties in GIS, the management of data quality and how uncertainties should be handled.

(UNI 789) Concepts for Spatial Thinking 789

The characteristics of visual material, as well as its importance for cognitive skills such as observation, recognition and differentiation. Attention is given to the role of visual material (especially maps) in the transfer, explanation and modelling of information.

(UNI 790) Visualisation 790

The variety of media available for GIS and their characteristics, as well as the rules for design in the different media applications, and the question of style and how visualisation influences and controls the transfer of information. Aspects included are cartographic design, computer graphics and visualisation in GIS.

(UNI 791) GIS in Organisations 791

The role of GIS in organisations and the socio-techniques of computerising, as well as the role of GIS in the corporate strategy of the particular organisation. Attention is given system development methodology for GIS deployment, as well as various development techniques.

(UNI 792) Project Management 792

The importance of models in project analysis and management, and the most important approaches and models for this purpose. Also included are a critical evaluation of the characteristics of projects, and insight into the role of GIS in organisations.

(UNI 793) Remote Sensing and GIS

The technical and methodological aspects which are important for the integration of remote sensing and GIS. Includes the basics of remote sensing, digital image processing and data integration.

BSc(Hons) Geology (Code 02240141)

Admission

A BSc degree with Geology as major subject. Students attend 4 l.p.w. during the 1st semester and 3 l.p.w as well as seminar and group discussions in the 2nd semester. The rest of the time in the 1st semester is devoted to practical training and in the 2nd semester to an approved project). Ancillary courses may be required. Full details are available from the Head of Department.

BSc(Hons) in Exploration Geophysics (Code 02240351)

Admission

An appropriate BSc degree. This option builds on the subject choice made in the third year of the Exploration Geophysics study programme. Students who hold a BSc degree with Exploration Geophysics as study programme, may register for the BSc(Hons) degree course specialising in Exploration Geophysics. Students who hold a BSc degree with at least two semester courses each in Physics and Mathematics and Geology at 200 level, may be admitted to the BSc(Hons) degree course specialising in Exploration Geophysics, in which case certain ancillary study may be prescribed by the Head of the Department and the duration of the course will then be eighteen months. For students holding a BSc degree with specialisation in Exploration Geophysics: Four lectures and one seminar class per week; the rest of the time is devoted to practical training, seminars and group discussions. For students holding a BSc degree without Exploration Geophysics: As above, except that the full first semester and *capita selecta* from Exploration Geophysics of the second semester as for the BSc must be added, as well as any other study that may be prescribed by the Head of the Department.

BSc(Hons) Engineering Geology (Code 02240371)

Admission

A BSc degree with Environmental and Engineering Geology as study programme. An admission examination may be required.

Students who have obtained a BSc degree with Geology as main subject, may be admitted to the BSc(Hons) study with specialisation in Engineering Geology in which case supplementary studies will be prescribed by the Head of Department.

Curriculum

A minimum of 64 course credits are required for the degree. These are compiled as follows:

24 units from IGL 703, IGL 711, IGL 712, IGL 713, IGL 714, IGL 715 en IGL 716.

24 units from IGL 704, IGL 721, IGL 722, IGL 723, IGL 724, IGL 725 en IGL 726.

The outstanding 16 course units can be compiled from courses approved by the Head of Department. The minimum duration of studies is one year and the degree has to be completed within two years.

BSc(Hons) in Applied Sciences(Engineering Geology)(Code 02240073)

Admission

A BSc degree with Environmental and Engineering Geology as study programme.

Other students holding a BSc degree with Geology as major subject, may be allowed to register for the BSc(Hons) degree specialising in Engineering Geology, in which case certain ancillary studies will be prescribed by the Head of the Department, in which case the duration of the study will be eighteen months. Details are obtainable from the Head of the Department.

Curriculum

A minimum of 68 course credits are required for the degree, compiled as follows:

22 units from GTX 312, GTX 314, GTX 321, GTX 324 en GTX 325.

16 units from IGL 703, IGL 711, IGL 712, IGL 713, IGL 714, IGL 715 en IGL 716.

16 units from IGL 704, IGL 721, IGL 722, IGL 723, IGL 724, IGL 725 en IGL 726.

The outstanding 14 course units may be compiled from courses approved by the Head of Department. The minimum duration of study is one year and the degree has to be completed within two years.

First Semester:

(IGL 703) Engineering Geology 703 (8 credits)

The Engineering Geology of South Africa.

(IGL 711) Mapping Project 711 (8 credits)

Aerial photographic studies and field mapping in order to compile an engineering geological map of an area.

(IGL 712) Scouting Project 712 (4 credits)

Field work and report of a survey of a proposed construction site.

(IGL 713) Site Surveying 713

(8 credits)

Field work which includes mapping, soil profiling, drilling core analysis or seam surveys, as well as report on site survey for feasibility and design stage.

(IGL 714) Environmental Study 714

(4 credits)

Environmental impact and ground water study, which includes field work and report.

(IGL 715) Literature Study 715

(4 credits)

Reference work, summary and presentation of literature on specific subjects, or from specific reference works.

(IGL 716) Laboratory Project 716)

(4 credits)

Sampling, laboratory tests and reporting on the geotechnical aspects of soil and rock.

Second Semester:

(IGL 704) Engineering Geology 704

(8 credits)

The engineering geological properties of rock and rock masses and its implementation in civil engineering.

(IGL 721) Problem Materials 721

(4 credits)

The engineering geology aspects of expandable, yielding and dispersive and soft soil in the reactive and not so durable rock formations.

(IGL 722) Rock Engineering 722

(8 credits)

Description, classification and geotechnical properties of rock masses.

(IGL 723) Engineering Applications 723

(8 credits)

The influence of geological aspects on the layout, design and construction of engineering projects, including dams, tunnels, declines and urban development.

(IGL 724) Construction Material 724

(4 credits)

Requirements for concrete aggregate, dam and road construction material.

(IGL 725) Geotechnical Processes 725

(4 credits)

The principles and implementation of computation, stabilisation, cementing and anchoring.

(IGL 726) Professional Practice 726

(2 credits)

Project management, legal aspects and professional ethics.

BSc(Hons) degree specialising in Meteorology (Code 02240070)

Admission

BSc degree specialising in Earth Sciences (study programme in Meteorology) or an equal qualification, or a appropriate BSc degree.

Duration

One year full-time, or two year part-time.

Curriculum

The course consists of seven course subjects compiled from the following, as well as a research project:

AWM 701	Dynamical and Numerical Meteorology (spec) 701
AWM 705	Physical Meteorology and Climatology (spec) 705
AWM 780	Statistical and Climate Modelling 780
AWM 710	Dynamical Meteorology 710
AWM 712	General Numerical Modelling 712
AWM 720	Specialised Numerical Modelling 720 (V/V AWM 710 en AWM 712)
AWM 781	Radiation and High Atmospheric Meteorology 781
AWM 782	Radar Meteorology 782
AWM 783	Cloud Dynamics 783
AWM 784	Cloud Micro Physics 784
AWM 785	Tropical Meteorology and Weather Prediction Techniques 785
AWM 786	Border-line Meteorology 786
AWM 787	Maritime Meteorology 787
AWM 788	Research Project 788
AWX 786	Climate 786
AWX 789	Programming in Meteorology 789

A student who has not obtained a BSc degree in Meteorology, also has to pass AWM 710 en AWM 705, in addition to the seven courses required. A maximum of two other subject courses may be selected in consultation with the Head of Department from courses presented by the Faculty of Engineering or Biological en Agricultural Sciences.

A student who has qualified for a BSc degree in Meteorology, cannot register for AWM 701 and/or AWM 705.

BSc(Hons) Applied Sciences (Meteorology) (Code 02240072)

Curriculum

The course consists of eight subject courses selected from the following:

AWM 701	Dynamical and Synoptic Meteorology 701
AWM 705	Physical Meteorology and Climatology 705
AWX 780	Instrumentation and Observations 780
AWX 781	Advanced physical Meteorology 781
AWX 782	Non-tropical and Tropical Systems 782
AWX 783	Prediction Techniques 783
AWX 784	Meso-scale Meteorology 784
AWX 785	Specialised Prediction techniques 785
AWX 786	Climate 786
AWX 789	Programming in Meteorology 789
AWM 788	Research Project 788

Other subject courses may be prescribed by the Head of Department.

BSc(Hons) in Computer Science (Code 02240081)

Admission

An appropriate B degree, usually with Computer Science at 300 level.

Duration

The study normally extends over one year for full-time and two years for after-hours students. The Department reserves the right to cancel a student's studies who fails more

than one subject in a given year. The curriculum consists of eight credits in advanced Computer Science and Information Technology. Details are obtainable from the Head of the Department, as well as in the School for Information Technology's information pamphlet, or consult the home page www.cs.up.ac.za.

BSc(Hons) degree in Statistics (Code 02240191)

Admission

An appropriate B degree with Mathematical Statistics at 300 level, usually with an average of at least 60% .

Duration

The study normally extends over one year for full-time and two years for part-time students. A student qualifies for the honours degree after having achieved EIGHT credits. Details are obtainable from the Head of the Department.

BSc(Hons) degree in Applied Mathematics (Code 02240171) Mathematics (Code 02240181), Mathematics of Finance (Code 02240272) and Mathematics Education (Code 02240271)

Admission

An appropriate B degree with an average of at least 60% for Mathematics at 300 level.

Duration

The course normally takes one year in the case of full-time and two years in the case of part-time students.

Curriculum

The curriculum comprises a study of fields in advanced Mathematics and applications of Mathematics chosen in consultation with and subject to the approval of the Head of the Department. A brochure with details is obtainable from the Head of the Department.

SYLLABI MASTER'S DEGREES

MSc in Earth Science Practice and Management (Code 02250072)

(a) Admission

Postgraduate Diploma in Earth Science Practice and Management, or BSc(Hons) in Geology, or equal four-year degree, or any other qualification accepted by the Senate as equal in terms of Regulation G.62.

Additional preparatory course work may be set by the Head of Department prior to admission.

Students who have already obtained a Postgraduate Diploma in Earth Science Practice and Management, only submit the essay for completion of the MSc course.

(b) Duration and Curriculum

The minimum duration is two years of part-time study. For students who obtain admission on the grounds of a Diploma in Earth Science Practice and Management, the duration of the course is a minimum of one year.

The curriculum is determined in consultation with the Head of Department. The courses consists of theoretical modules (16 credits) and a treatise (6 credits).

The subject of the essay has to be approved by the Head of Department.

(c) Examination admission and pass requirements

To be admitted to the examinations, a student has to obtain a semester or year mark of at least 40%. A subminimum of 40% is required in the examination and a final mark of 50% to pass.

In some modules a semester or year mark may not be required, in which case the examination mark has to be 50% or more in order to pass. The relevant modules will be indicated in the departmental guides.

A minimum of 50% is required in order to pass in the essay.

(d) Degree with distinction

The degree is conferred with distinction on a student who obtains an average of at least 75% in 50% of the theoretical modules (based on course credits), **as well as** an average of at least 65% in the remaining theoretical modules, as well as 75% in the Essay.

(e) Curriculum

Subject Code	Module	Duration	Prerequisite	Credits
GLG 801	Minerals 801	Year	-	2,5
GLG 802	Mineral Evaluation 802	Year	-	2,5
GLG 803	Mining 803	Semester	-	1
GLG 804	Extraction Metallurgy 804	Semester	-	1
GLG 805	Mining Law 805	Semester	-	1
GLG 806	Transport Logistics 806	Semester	-	1
PJB 801	Project Management 801	Year	-	2
PJB 802	Project Management 802	Year	PJB 801	2
MLE 810	Human Ecology 810	Semester	-	1
SKB 783	Project Accounting 783	Semester	-	1
NMK 820	Research Method- ology 820	Semester	-	1
GLG 809	Treatise 809			6

(GLG 801) Minerals 801 (50 contact periods)

Minerals and their geological and mineralogical properties in the formation context, the value of rocks and minerals, industrial minerals, case studies.

(GLG 802) Mineral Evaluation 802 (50 contact periods)

Geostatistics; geo-information systems; mineral economics; basic parameters of evaluating minerals, rocks, financial analysis, case studies.

(GLG 803) Mining 803 (20 contact periods)

Mining methods and costs, case studies.

(GLG 804) Extraction Metallurgy 804 (20 contact periods)

Mineral beneficiation and extraction; pyrometallurgy; hydrometallurgy; plant design and costs; case studies.

(GLG 805) Mining Law 805(20 contact periods)

Comparative studies for mining and the environment codes in South Africa and other countries.

(GLG 806) Transport Logistics 806 (20 contact periods)

Transport systems, economics of transport systems.

(MLE 810) Human Ecology 810 (20 contact periods)

Theoretical substructures for effective communication skills; personal experience and patterns of human behaviour; inner world and the intimate experience realm of humans; psycho-ecological phenomena; interpersonal communication; inter-group relations and leadership; self-assertion and self-revelation; effective listening and negotiating skills.

(SKB 783) Project Accounting 783 (20 contact periods)

Cost and cost accounting principles; standard costs, systems; cost/volume equations; measurement and evaluation, certificates, escalation, financial analysis and investment problems.

(PJB 801) Project Management 801 (40 contact periods)

Introduction to project management, organisational and project structures; the project team and the role of its members, including motivation and team-building techniques; variables in success; negotiating and conflict resolution skills; communication and the management of meetings; trade-off analysis; marketing services; strategic planning; economic aspects; financial management; contractual arrangements; contractual procedures; quality management, project-risk management.

(PJB 802) Project Management 802 (40 contact periods)

Project scope management (project planning); project cost management; project plans, project procurement management; time management (planning techniques).

(NMK 810) Research Methods 810 (20 contact periods)

Introduction to scientific research; planning and design of a research project, methodology and research design, presentation of the results and technical care.

(GLG 809) Treatise 809

A short dissertation in which the student has to prove that he or she has mastered the theoretical knowledge of the modules.

MSc in Applied Sciences (Chemistry) (Code 02250122)

Admission

BSc(Hons) in Applied Sciences or equivalent qualification, in which case the candidate has to prove that he or she has achieved the standard of a BSc(Hons) in Applied Sciences.

MSc in Geography (Code 02250411)

Admission

BSc(Hons) or equivalent qualification.

MSc Environment and Society (Code 02250410)

Admission

Diploma in Environment and Society or a BSc(Hons) in Geography or equivalent 4-year degree or any other qualification that the Senate may deem equivalent in accordance to the stipulations of Regulation G.1. and G.62.

Additional preparatory course work may be required at the discretion of the Head of Department before admission. Candidates already in possession of a Diploma in Environment and Society, does the essay in completion of the MSc course.

Duration

Full time: 2 years [course work (1 year) and essay (1 year)].

Part time: 3 years [course work (2 years) and essay (1 year)].

Curriculum

To obtain the degree, a minimum of 7 courses plus an essay are required.

Compulsory courses

(OMS 880) Environment and Society 880

Outstanding courses:

(OMS 881) Environmental Change 881

(OMS 882) Southern African Geomorphology 882

(OMS 883) Polar and Mountain Environments 883

(OMS 884) Environment and Development 884

or a course selected in consultation and with the approval of the Head of Department.

(OMS 895) Research Report 895

(50% of final mark)

MSc with specialisation in Science Education (code 02250442)

Admission

An Honours degree or equivalent qualification in an applicable field of the natural sciences.

The Candidate has to prove his or her skills in Education Research Methodics (including applicable statistical methods) and in the school of thought of this field of study. Should a student not meet these requirements, he or she may still be admitted on condition that additional study assignments be completed as agreed, or that an examination be passed.

Duration

A candidate has to be registered for the Honours degree or an equivalent qualification for at least one year after having met all the requirements, and must complete it within a maximum of four years.

Curriculum

The emphasis is on a project which focuses on an investigation of the development of a scientific field of study which will be accessible to learners at all levels, rather than just to those in the pure sciences or field of education.

The project must lead to a dissertation which must be published in journals for science education. In the case of a master's programme in which courses in both science education and in a scientific field of specialisation are prescribed, the project must lead to an essay which will carry the weight of half of the degree study.

Where applicable the candidate will register for the following courses:

SCE 881 Education Research Methods (7)

The aim of the course is to

- acquire knowledge in the field of education research
- understand research terms, principles and methods
- acquire skills such as: the formulation and definition of a research problem, the use of literature to acquire further knowledge concerning the problem, the design of the research process, interpretation of research results from which deductions can be made

SCE 882 Education Statistics (7)

The course follows a conceptual approach to the field of statistical principles. The emphasis is on the understanding of selected statistical procedures and on understanding the logic of statistical conclusions. The aim of the course is statistical literacy as a tool for research.

SCE 883 Curriculum Development and Evaluation in Science Education (8)

The course starts off with modern thoughts in the field of science education, content and curriculum development, both internationally and in South Africa. Evaluation forms an integral part of curriculum design. Special attention is given to the theoretical principles of evaluation, with specific attention to validity and reliability. Applications of these elements to standardised as well as teacher-developed tests are investigated. In conclusion, new forms of evaluation are studied.

SCE 884 Tendencies in Science Education (8)

The aim of this course is to: investigate and discuss the modern approaches to science education (for example constructive learning); investigate restructuring proposals in science education critically; look at the consequences of all this for the teacher; develop a curriculum or curriculum units in science education; design evaluating strategies in line with the aims of the curriculum; investigate activities, computer software, computer-connected laboratory equipment, video material and integrated technology systems to support the curriculum.

SCE 885 Essay (10)

A candidate has to present at least five seminar lectures in science education or in the field of scientific specialisation during the study period.

Nature of Evaluation

By means of written and oral examinations, as well as projects and continued evaluation. Evaluation of seminar lectures takes place immediately after each seminar and is done by the leader and qualified colleagues. The dissertation will be presented during the departmental seminar and a final mark will be awarded by the leader after discussions with the examination committee appointed by the Centre for Science Education. The committee has the opportunity to question the candidate during the presentation of the essay or

dissertation. External examiners will be selected from academics and qualified persons involved in the field of natural sciences and science education.

Evaluation of course work is problem orientated.

SCE 890 Dissertation and Essay

- (a) The candidate must deliver proof of originality, either in the content regarding the scientific field of specialisation, or in the specific field of problem solving.
- (b) The candidate must give proof of advanced knowledge regarding literature in the field of specialisation and science education, be able to independently gather relevant information from several sources, be able to arrange the material systematically and to present it as a whole.
- (c) The results have to be presented in a format which meets the requirements for publication in the specific field of study.
- (d) The candidate must be able to differentiate between important and less important findings.
- (e) The candidate has to evaluate the importance of his or her own dissertation/essay.
- (f) The candidate's knowledge has to improve markedly.

MSc in Applied Mathematics (Code 02250171), Mathematics (Code 02250181), Mathematics of Finance (Code 02250182) and Mathematics Education (Code 02250183)

Admission

An appropriate honours degree with an average of at least 60% in each module. A brochure with full details is available from the Head of Department.

Magister in Information Technology (Code 02250082)

Admission

Subject to the stipulations of Gen.. Reg G.1.3; G.30 en G.62, an applicable four-year degree or a four-year degree with appropriate experience is a requirements for admission

Duration

Part-time studies: 2 years – Full-time studies: 1 year.

Conferring of degree

The M Information Technology degree is awarded after successful completion of 12 credits

Essay or project: 3 credits

Compulsory subjects: 3 credits

Choice from list of available subject courses: 6 credits

Additional postgraduate course work may be prescribed.

Pass requirements

At least 50% has to be obtained in the essay as well as the project and the prescribed course work.

Degree with distinction

The degree is conferred with distinction on student with a final mark of at least 75%.

Curriculum

- MIT 810 Research Methodology 810
- MIT 811 Information Technology in Organisations 811
- MIT 812 Information Technology as a Discipline 812
- MIT 813 Programmature 813
- MIT 814 Apparature 814
- MIT 815 Information 815
- MIT 816 Learning Theory 816
- MIT 821 New developments in Information Technology 821
- MIT 822 Information Technology of Economics 822
- MIT 823 Information Technology of Project Management 823
- MIT 824 Thoughts on IT Quality Insurance 824

DEGREES IN HOME ECONOMICS

H.1 SUBJECT COURSES

(a) Baccalaureus subjects

In a subject listed in the prerequisite column, that is followed by the symbol GS, a combined mark of at least 40% must be obtained before admission to the course listed in the second column. A final mark of at least 40% is also acceptable in such an instance. A subject without any symbol must, however, be passed. A parallel course must be taken before or concurrently with the course in the second column.

Code	Course	Weights		Prerequisite	Parallel Course	Credit
		L	P			
APP 120	Equipment Studies 120	2		-	-	4
APP 210	Equipment Studies 210	2		-	-	4
BEH 221	Housing 221	3		-	-	6
ERG 110	Ergonomics 110	2		-	-	5
GSS 310	Family Studies 310	2		SOC 251,252,253,254 or OPV 221	-	4
HBS 410	Home Management 410	3		4th year status	-	6
HBS 420	Home Management 420	3		HBS 410 GS	-	6
HHK 480	Project Home Economics 480	2	-	Final year status	-	4
KLD 220	Clothing 220	4		-	-	8
KLD 310	Clothing 310	3		-	-	6
KLD 410	Clothing 410	3		KLD 310, BEM 220	-	6
KLD 412	Clothing 412	3		Final year status	-	6
KLD 420	Clothing 420	3		KLD 410	-	6
KLD 421	Clothing 421	2	1	KLD 412	-	7
KLK 120	Clothing Construction 120	1	2	-	-	8
KLK 210	Clothing Construction 210	1	2	KLK 120	-	8

Nat, Agric and Info Sciences I

KLK 220	Clothing Construction 220	2	2	KLK 210	-	10
KLK 310	Clothing Construction 310	2	2	KLK 220	-	10
OBG 110	Principles of Design 110	2		-	-	6
ONT 221	Design 221	2	1	OBG 110	-	7
ONT 311	Design 311	2	1	ONT 221		7
SEM 180	Seminar 180	2	-	-	-	6
SEM 212	Seminar 212	3	-	-	-	6
SEM 216	Seminar 216	2	-	-	-	4
SEM 481	Seminar 481	1	-	Final year status		2
TKS 210	Textiles 210	3		-	-	8
TKS 220	Textiles 220	3		TKS 210GS	-	8
TKS 320	Textiles 320	2		TKS 220	-	6
VBG 321	Consumer Behaviour 321	3		-	-	6
VDB 320	Food Service Management 320	4	1	VDS 220,221 VDS 320		11
VDB 410	Food Service Management 410	3	1	VDB 320	-	9
VDB 411	Food Service Management 411	-		VDB 320	-	2
VDG 120	Nutrition 120	3		-	-	6
VDG 211	Nutrition 211	3		VDG 120 and PHG 211, 212 or VDG 120 and FSG 110, 120	-	8
VDG 212	Nutrition 212	4		VDG 120	-	10
VDG 320	Nutrition 320	3		VDG 211	-	8
VDS 110	Foods 110	3		-	-	6
VDS 210	Foods 210	3	1	VDS 110GS, Grade 12 Science or SCI 150, 160	-	9
VDS 221	Foods 221	3	1	VDS 110GS, Grade 12 Science or SCI 150,160		9
VDS 310	Foods 310	5	1	VDS 221	-	13
VDS 320	Foods 320	3	2	VDS 221GS, VDG 120	-	12
VDS 423	Foods 423	3		VBG 321	-	6
VDS 413	Foods 413	3	1	-	-	9
VDS 422	Project Foods 422	1	2	VDS 310	-	8
VHK 400	Subject Didactics Home Economics 413	2	1	VDS 310	-	16
VHS 400	Subject Didactics Hotelkeeping & Catering 400	2	1	-	-	16
VKW 309	Vacation Work 309	-	-	-	-	-

VLG 310	Extension 310	1	1	3rd year status		5
VLG 320	Extension 320	1	1	VLG 310GS	-	5

(b) Honours Subjects

Code	Course	Weights		Prerequisite	Parallel Course	Credit
		L	P			
APP 780	Equipment studies 780	4				4
BEH 780	Housing 780	4				4
ERG 711	Ergonomics 711	4				4
GSS 780	Family Studies 780	4				4
HBS 780	Home Management 780	4				4
HSK 710	Socio-Cultural Studies: Cultural Orient 710	2				2
HSK 712	Socio-Cultural studies: Consumer Orientat	2				2
HSK 713	Socio-Cultural studies: Development Orient	2				2
HSK 781	Socio-Cultural Studies: (Clothing) 781	4				4
HSK 783	Socio-Cultural Studies: (Foods) 783	4				4
HTP 810	Theoretical Perspect- ives 810	4				4
KLD 780	Clothing 780	4				4
KLD 781	Clothing 781	2				2
KLD 782	Clothing 782	4				4
KLD 783	Clothing 783	4				4
KLD 784	Clothing 784	4				4
NME 814	Research Methodo- logy 814	8				8
NPJ 820	Research Project 820	8		NME 814, HTP 810		8
PRJ 780	Project 780	2-4				2-4
PRJ 781	Project 781	4				4
PRJ 880	Project 880	2-8				2-8
TKS 781	Textile studies (Clothing) 781	2				2
VBG 711	Consumer Beha- viour 711	2		VBG 211 or BEM 220		2
VDB 713	Food Service Manage- ment 713	4				4
VDB 721	Food Service Manage- ment 721	4		MKB 800		4
VDG 780	Nutrition (Development phase) 780	2				2
VDK 721	Subject Didactics 721	6				6
VDS 782	Foods 782	4				4
VLG 720	Extension 720	4				4

(c) Courses offered outside the Department

Code	Course	Weights		Prerequisite	Parallel Course	Credit
		L	P			
APL 151,152	Anthropology 151,152	3		-		6
APL 153,154	Anthropology 153,154	3		APL 151,152GS		6
APL 251,252	Anthropology 251,252	3		APL 151,152,153,154		
APL 253,254	Anthropology 253,254	3		APL 251,252GS		
APL 352,352	Anthropology 351,352	3		APL 251,252,253,254		
APL 353,354	Anthropology 353,354	3		APL 351, 352GS		
BCM 216	Proteins and Enzymes 216	2	½	CMY 141GS		6
BCM 217	Carbohydrate Metabolism 217	2	½	CMY 141GS		6
BCM 226	Lipids & Cell Metabolism 226	2	½	BCM 217GS		6
BCM 227	Biosynthesis of Macromolecules 227	2	½	BCM 217GS		6
BEM 151, 152	Marketing Management 151, 152	3	-	-		6
BEM 161, 162	Marketing Management 161, 162	3	-	BEM 151, 152GS		6
BEM 210	Marketing Management 210	3	-	BEM 110/120 with GS in the other; Par 1.2		6
BEM 220	Marketing Management 220	3	-	BEM 110/120 with GS in the other; Par 1.2		6
BEM 310	Marketing Management 310	3	-	BEM 110,120; 210/220 with GS in the other		6
BEM 320	Marketing Management 320	3	-	BEM 310GS		6
BER 210	Business Law 210	3	-	-		6
BER 220	Business Law 220	3	-	-		6
CMY 112	First course Chemistry 112	4	1	Par 1.2		11
CMY 122	General Chemistry 122	4	1	-		11
EKN 151,152	Economics 151,152	3	-	-		6
EKN 120	Economics 120	3	-	EKN 151,152GS		6
FRK 112	Financial Accounting 112	4	-	Par 1.2		8
FSG 110	Physiology 110	3	-	-		6
FSG 120	Physiology 120	3	-	FSG 110GS		6
GBK 211	Building Climate 211	3	-	-		8
KGK 100	History of Art 100	3	-	-		12
KGK 200	History of Art 200	3	-	KGK 100		12
KGK 300	History of Art 300	3	-	KGK 200		12
KTS 110	Cultural History 110	3	-	-		6

KTS 120	Cultural History 120	3	-	-	6
MLB 111	Molecular and Cell Biology 111	4	1	Par 1.2	11
MBY 120	Introductory Micro- biology 120	4	1	MLB 111GS	11
MBY 225	Micro Biology of Foods 225	2	1	MBY 120	7
MWC 101	Social Work 101 (CS from MWT 100)	3	-	-	6
MWC 201	Social Work 201 (CS from MWT 200)	3	-	MWC 101	6
MWC 301	Social Work 301 (CS from MWT 300)	3	-	MWC 201	6
OBS 151,152	Business Manage- ment 151, 152	3	-	-	6
OBS 120	Business Manage- ment 120	3	-	OBS 151,152GS	6
OBS 251,252	Business Manage- ment 251,252	3	-	OBS 110/120 with a GS in the other; Par 1.2.	6
OBS 261,262	Business Manage- ment 261,262	3	-	OBS 151,152/161,162 with GS in the other; Par 1.2; FRK 120/ FBS 210 GS	6
OBS 351,352	Business Manage- ment 351,352	3	-	OBS 151,152,161,162; OBS 251,252/261,262/ with a GS in the other	6
OBS 361,362	Business Manage- ment 361,362	3	-	OBS 151,152,161,162; OBS 251,252/261,262, Any four of OBS 251,252 261,262,351,352	6
OMG 120	History of the Environ- ment 120	3	½A	-	8
OMG 223	History of the Environ- ment 223	3	½A	OMG 121	8
OMG 323	History of the Environ- ment 323	3	½A	OMG 223	8
OTR 111	Theory of Design 111	4	½A	-	10
OPV 111	Education 111	3	-	-	6
OPV 121	Education 121	3	-	OPV 111 GS or Permission : Dean 6	
OPV 211	Education 211	3	-	OPV 111,121	6
OPV 221	Education 221	3	-	OPV 111,121	6
OPV 311	Education 311	4	-	OPV 211,221	8
OPV 321	Education 321	4	-	OPV 211, 221	8
PHY 131	General Physics 131	4	1	Par 1.2	11

FRK 161,162	Accounting 161,162				
and FRK 181	and FRK 181	4		FRK 151,152GS	8
SLK 151	Psychological Perspectives151				
SLK 152	Cognitive Processes				
SLK 153	Social Psychology				
SLK 156	Developmental Systems Theory				
SLK 251	Personology 251			SLK 151,152,153,156	
SLK 254	Social Psychology 254			SLK 151,152,153,156	
SLK 255	Perspectives on the Family 255			SLK 151,152,153,156	
SLK 256	Psychological Assessment I 256			SLK 151,152,153,156	
SLK 351	Community Psychology I 351			SLK 251,254,255, 256	
SLK 352	Abnormal Behaviour 352			SLK 251,254,255,256	
SLK 353	Critical Perspectives 353			SLK 251,254,255,256	
SLK 354	Community Psychology in Practice 354			SLK 251,254,255,256	
SOC 151	Social Organisation and the Individual 151	3	½		3
SOC 152	Social Institutions 152	3	½		3
SOC 153	Social Inequality 153	3	½		3
SOC 154	Sociometry 154	3	½		3
SOC 251	Social Problms 251	3	½	SOC 151– 154	3
SOC 252	Domestic Life 252	3	½	SOC 151–154	3
SOC 253	Medical Sociology 253	3	½	SOC 151–154	3
SOC 254	Demographic Resch 254	3	½	SOC 151–154	3
SOC 351	Adv Demographic Research 351	3	½	SOC 251–254	3
SOC 352	Social Theory 352	3	½	SOC 251–254	3
SOC 353	Industrial Sociology 353	3	½	SOC 251–254	3
SOC 354	Demography 354	3	½	SOC 251–254	3
STK 151	Statistics 151	3		Par 1.2	5½
STK 152	Statistics 152	3		Par 1.2	5½
STK 161	Statistics 161	3		Par 1.2	4½
VAN 400	Subject Didactics General Science 400	3	-		12
VDW 222	Food Science 222	2	½-		6
VDW 314	Food Science 314	2		1BCM 216,217	7
VDW 324	Food Science 324	2		1VDW 314	7
VDW 432	Food Science 432	1	-		4
(d) Postgraduate Courses					
DPE 710	Didactic Pedagogic 710 1 l.p.w 3			-	
VDK 710	Subject Didactics 710	1		-	3
VDW 701	Food Science 701	6		-	6

H.2 BACHELOR OF HOME ECONOMICS (BHomeEcon)

Also consult General Regulations G.1 to G.15.

The curriculum for the Bachelor of Home Economics degree makes provision for a choice between three possibilities, i.e. Clothing Management, Food Management and General.

(a) Requirements for admission

- (i) **Clothing Management**
Matriculation exemption with at least 40% in Mathematics on Higher Grade and 50% at Standard Grade. (Physical Science is strongly recommended).
- (ii) **Food Management**
Matriculation exemption with at least 50% (D) on Higher Grade in both Mathematics and Physical Science. Also Par.1.2 for admission to specific courses.
- (iii) **General**
Matriculation exemption. Physical Science is strongly recommended.

(b) Duration

Four years of full-time study.

All students registered for full-time courses in B Home Economics (General), B Home Economics (Clothing Management), B Home Economics (Food Management), B Home Economics (Interior Design) have to pass the following computer literacy courses or present proof of equivalent training:

- CIL 171 and CIL 172 (Computer Literacy 171 and 172) before the end of the first semester of the first year of study.
 - CIL 173 (Computer Literacy 173) before the start of the third year of study.
- Courses are presented by the Damelin Computer School on the main campus.

(c) Curriculum

Unless the Dean, in consultation with the Head of the Department, decides otherwise, students compile their curricula as follows:

(i) Clothing Management (Code 02130181) (262 + 6 credits)

Economic and management subjects, for example Marketing Management, Business Management, Accounting, etc. provide a student with the necessary background to be able to accept a management position in the clothing trade or small business industry.

Subjects such a clothing construction, fashion design and textiles, give the student the ability to plan an own small business, establish and manage it, while the variety of subjects in clothing, prepares the student for diverse careers in fashion.

The formal sector offers several posts to clothing managers, and opportunities to progress to management of retail clothing outlets, where the person will be involved in coordination of stock, quality control, buying, advertising, or become a floor manager in chain-store clothing, and also train personnel. A career in design and clothing construction can also be extremely rewarding.

First year of study (75 credits)

First semester	Credits	Second semester	Credits
Financial Accounting 112	8	Accounting 121	8
Economics 110	6	Economics 120	6

Psychology Perspect 102	3	Social Psychology 153	3
Cognitive Processes 152	3	Developmt Syst Theory 156	3
Principles of Design 110	6	Seminar 180	4
Ergonomics 110	5	Clothing Construction 120	8
Anthropology 151,152	<u>6</u>	Anthropology 153,154	<u>6</u>
	37		38

Second year of study: (65 credits)

First semester	Credits	Second semester	Credits
Statistics 151,152	6	Design 221	7
Marketing Management 151		Marketing Management 161,	
152	6	162	6
Business Management 151		Business Management 161,	
152	6	162	6
Personology 251	3	Perspective on Family 255	3
Social Psychology 253	3	Psychological Assessment 256	3
Textiles 210	<u>8</u>	Textiles 220	<u>8</u>
	32		33

Third year of study (63 credits)

First semester	Credits	Second semester	Credits
Marketing Management 210	6	Marketing Management 220	6
Clothing 310	6	Clothing 220	8
Design 311	7	Business Law 220	6
Business Law 210	6	Clothing Construction 220	<u>10</u>
Clothing Construction 210	<u>8</u>		30
	33		

Computer and Information Literacy 171,172,173 (6)

Fourth year of study : (59 credits)

First semester	Credits	Second semester	Credits
Marketing Management 310	8	Marketing Management 320	8
Clothing 410	6	Clothing 420	6
Clothing Construction 310	10	Textiles 320	6
Clothing 412	6	Clothing 421	7
	<u>-</u>	Seminar 481	<u>2</u>
	30		29

(ii) Food Management (Code 02130122) (299 + 6 credits)

Food management entails the management of food outlets and businesses. The preparation of food for home consumption as well as large-scale quantities, are studied. Training in all aspects of food, and in the management sciences is an important part of the course.

A food manager is responsible for the control and management of a big food outlet, for example the kitchen of a hospital, hotel, university residences, etc.

First year of study (82 credits)

First semester	Credits	Second semester	Credits
First Course in Chemistry 131	11	General Chemistry 141	11

Molecular and Cell Biology 111	11	Introductory Microbiology 120	11
Physiology 110	6	Physiology 120	6
Business Management 151&2	6	Business Management 161&2	6
Foods 110	<u>6</u>	Seminar 180	4
	40	Equipment Studies 120	<u>4</u>
			42

Second year of study (87 credits)

First semester	Credits	Second semester	Credits
Proteins and Enzymes (BCM 216)	6	Lipid and Nitrogen Metabolism (BCM 226)	6
Carbohydrate Metabolism (BCM 217)	6	Food Science 222	6
Equipment Studies 210	4	Biosynthesis of Macromolecules (BCM 227)	6
Business Management 251&2	6	Consumer Behaviour 321	6
Statistics 151,152	6	Business Management 261&2	6
Foods 210	9	Nutrition 120	6
Ergonomics 110	<u>5</u>	Foods 221	<u>9</u>
Food Science 222	42		45

Third year of study (75 credits)

First semester	Credits	Second semester	Credits
Food Science 314	7	Food Science 324	7
Business Management 351&2	6	Business Management 361&2	6
Extension 310	5	Food Service Management 320	11
Foods 310	13	Foods 320	12
Nutrition 211	<u>8</u>		<u>-</u>
	39		36

Computer and Information Literacy 171,172,173 (6)

Fourth year of study (55 credits)

First semester	Credits	Second semester	Credits
Food Science 432	4	Microbiology of Foods 425	7
Foods 413	9	Foods 423	6
Food Service Management 410	9	Nutrition 320	8
Project Food Service Management 411	<u>2</u>	Project Foods 422	8
	24	Seminar 481	<u>2</u>
			31

(iii) General (Code 02130131) Full-time study (292 or 293 credits)

Home Economics is an accepted academic discipline which focuses especially on improvement of the general wellbeing of individuals, families and communities.

Depending on a student's personal interests, he or she may become involved with adult guidance, community development projects, research, personnel training for large organisations, catering or interior planning, for example kitchen design. Several possibilities exist for the establishment of an own business for the creative graduate, for example courses in clothing construction, food

preparation and entertainment, and the planning and production of interior products.

First year of study (81 credits)

First semester	Credits	Second semester	Credits
Physiology 110	6	Physiology 120	6
Psychological Perspect 151	3	Social Psychology 153	3
Cognitive Processes 152	3	Developmental Syst Theo 156	3
Soc Org & Individual 151	3	Soc Inequality 153	3
Soc Institutions 152	3	Sociometry 154	3
Ergonomics 110	5	Clothing Construction 120	8
Foods 110	6	Nutrition 120	6
Principles of Design 110	6	Seminar 180	4
Social Work 101	<u>6</u>	Equipment Studies 120	<u>4</u>
	41		40

Second year of study: (86 credits)

First semester	Credits	Second semester	Credits
Social Work 201	6	Foods 221	9
Foods 210	9	Perspectives on Family 255	3
Personology 251	3	Psychological Assessment 256	3
Social Psychology 254	3	Medical Sociology 243	3
Social Problems 251	7	Demographic Research 254	3
Domestic Life 252	3	Housing 221	6
Textiles 210	8	Textiles 220	8
Cultural History 110	<u>6</u>	Cultural History 120	<u>6</u>
	45		41

Third year of study: (73 credits)

First semester	Credits	Second semester	Credits
Social Work 301	6	Interior 321	5
Adv Demogr Research 351	3	Industrial Sociology 353	3
Social Theory 352	3	Demography 354	3
Equipment Studies 210	4	Clothing 220	8
Nutrition 211	8	Consumer Behaviour 321	6
Seminar 212	6	Nutrition 320	<u>8</u>
Interior 311	6		33
Family Studies 310	<u>4</u>		
	40		

Computer and Information Literacy 171,172,173 (6)

Fourth year of study: (52 or 53 credits)

First semester	Credits	Second semester	Credits
Extension 310	5	Extension 320	5
Home Management 410	6	Home Management 420	6
Clothing 310 and	6	Foods 320	12
Clothing Construction 210	8	Project Home Economics 480	<u>4</u>
or			27
Seminar 481 and	2		
Foods 310	<u>13</u>		
	25 or 26		

(iv) **General (Code 02130132) Part-time study (280/2 credits)**

This course is presented in English. The study programme is spread out over 6 years. Maximum duration of study is 8 year.

Compulsory Home Economics Subjects

Equipment Studies 121	Equipment Studies 211
Housing 221	Ergonomics 110
Family Studies 310	Home Management 410
Home Management 420	Interior 311
Interior 321	Clothing 220
Clothing 310	Clothing Construction 120
Clothing Construction 210	Design Principles 110
Seminar 180	Seminar 212
Textiles 210	Textiles 220
Consumer Behaviour 321	Foods 111
Foods 210	Foods 221
Foods 321	Foods 423
Nutrition 120	Nutrition 212
Nutrition 320	Extension 310
Extension 321	

Fundamental subjects that can be done elsewhere

Compulsory subjects:

Anthropology 151,152	Anthropology 153,154
English 103	Psychology 151,152
Psychology 153,156	
Sociology 151,152	Sociology 153,154

Choose any two of the following:

Anthropology 251,152	Anthropology 253,254
Psychology 251,254	Psychology 255,256
Sociology 251,252	Sociology 253,254

Choose any one of the following subjects to follow on the choice in the previous year:

Anthropology 351,352	Anthropology 353,354
Psychology 351,352	Psychology 353,354
Sociology 351,352	Sociology 351,352

All students with student number starting with 95, 96, 97, 98 and 99 may::

- (i) offer **two fundamental subjects** (SOC, SLK, APL) at **second-year level** plus **one** of these at **third-year level**
or

three of the abovementioned at second-year level.

- (ii) substitute VLG 320 with VLG 321
(iii) be exempted from SEM 481 and HHK 480.

The part time course is mainly presented telematically with limited contact time for the purpose of practical sessions, seminars and discussion of assignments. Contact sessions are scheduled annually during times when lecture halls and labs are not used for full time programmes. Students are therefore expected to attend classes in

the Department of Home Economics of the University of Pretoria during the following periods (this include exam sessions):

- Maximum two weeks in January
- Maximum two weeks in April
- Maximum three weeks in June/July
- Maximum two weeks in November/December.

(a) Admission to a subsequent year of study

(i) All the degrees in Home Economics (except part-time studies)

A student who did not pass all the prescribed courses of a particular year of study, has to register for the outstanding courses first. With the approval of the Head of the Department, courses of the following year of study may be taken in advance only if no timetable clashes occur; all the requirements and prerequisites have been met and not more than a specified number of credits per semester are taken. The credits of the semester of which courses are repeated, are taken as a guideline for the calculation of the number of credits permitted.

- (aa) A student registers for the second year when at least 80% of the first year course units have been passed.
- (bb) A student registers for the third year when at least 85% of the course units of the previous years have been passed.
- (cc) A student registers for the fourth year when at least 95% of the course units of the previous years have been passed.

For Food Management, students are required to do appropriate vacation work for 3 weeks during the University recess, at the end of second year of study and prior to the commencement of the second semester of third year of study, at an organisation or institution approved by the Head of the Department.

(ii) Part-time students

A student is allowed to the subject courses KLD 220, GSS 310, BEH 221 and VGB 320, when the following courses have been passed.

- At 100 level: Psychology, Sociology, Anthropology
- At 200 level: Two of Psychology, Sociology, Anthropology.

For students who started studying in this field before 1998, the following applies:

- *Four subjects at 100 level of Psychology, Sociology, Anthropology, English 102.*
- *At 200 level, Psychology, Sociology and Anthropology.*

(b) Special examination

A student who fails a maximum of two courses in the final year of study, may be admitted to a special examination in those courses at the end of the first semester of the following year, only if a final mark (examination plus semester mark) of at least 40% is obtained.

(c) Degree with distinction

The degree is conferred with distinction on a student who obtains an average of at least 75% in the following courses:

- (i) **Clothing Management**
Marketing Management 310 and 320; Clothing 320, Clothing 410, 412, 420 and 421.
- (ii) **Food Management**
Six of the following subjects:
Foods 310, 320, 413, 423;
Food Service Management 320, 410;
Business Management 351, 352, 361, 362.
- (iii) **General**
Six of the following subjects:

Family Studies 310	Home Management 410, 420
Clothing 310	Clothing Construction 210
Interior 321	Foods 310
Nutrition 320	Sociology 351,352,353,354
Extension 310, 320	Foods 320

H.3 BACHELOR OF HOME ECONOMICS (Ed) [BHomeEcon(Ed)] (Code 02133121)

Also consult General Regulations G.1 to G.15.

Students with an interest in the natural sciences aspects of Home Economics and who wish to become teachers, should register for this course.

- (a) **Admission requirements**
Matriculation exemption certificate with at least 50% (D) in Mathematics and Physical Science at higher grade. Consult paragraph 1.2.
- (b) **Duration**
Four years of full-time study. Students have to complete the prescribed practical work.
- (c) **Curriculum (363 credits)**
Unless the Dean, in consultation with the Head of the Department, decides otherwise, students compile their curriculum as follows:

First year of study (80 credits)

First semester	Credits	Second semester	Credits
General Physics 131 (PHY 131)	11	General Chemistry 141 (CMY 141)	11
First course in Chemistry 131 (CMY 131)	11	Physiology 120	6
Physiology 110	6	Nutrition 120	6
Foods 110	6	Clothing Construction 120	8
Ergonomics 110	5	Seminar 180	<u>4</u>
Principles of Design 110	<u>6</u>		<u>35</u>
	45		

Second year of study (90 credits)

First semester	Credits	Second semester	Credits
Molecular and Cell Biology 111	11	Microbiology 120	11
Statistics 114	6	Equipment Studies 120	4
Textiles 210	8	Textiles 220	8

Seminar 212	6	Foods 221	9
Education 111	6	Education 121	6
Foods 210	<u>9</u>	Housing 221	<u>6</u>
	46		44

Third year of study (86 credits)

First semester	Credits	Second semester	Credits
Education 211	6	Education 221	6
Foods 310	13	Foods 320	12
Interior 311	6	Nutrition 320	8
Nutrition 211	8	Clothing 220	8
Family Studies 310	4	Consumer Behaviour 321	6
Equipment Studies 210	<u>4</u>	Interior 321	<u>5</u>
	41		45

Fourth year of study (66 credits)

First semester	Credits	Second semester	Credits
Education 311	8	Education 321	8
Home Management 410	6	Home Management 420	6
Subject Didactics: Home Economics 400 or	8	Subject Didactics: Home Economics 400 or	8
Subject Didactics: General Science 400	8	Subject Didactics Hotel Management and Catering 400	8
Subject Didactics: Hotel Management and Catering	6	Subject Didactics: General Science 400	6
School Practice 400 SKP 400	<u>4</u>	Foods 423	<u>6</u>
	32		34

The following courses may already be taken from the second year onwards if they fit into the timetable: (41 credits)

ASV 402	General School Guidance 402	(4)
BYO 400	Religious Instruction 400*	(4)
MBK 402	Human Movement Science 402	(12)
OKO 401	Education Communication 401	(8)
OWM 400	Education Media 400	(4)
REG 420	Computer Literacy 420	(4)
SOA 400	School Organisation and Administration 400	(4)
TED 400	Language Endorsement 400	(1)

* Students may apply for exemption from Religious Instruction 400 on the basis of conscientious objection. A properly motivated application, must be addressed, in writing, to the Dean: Faculty of Education, who will approve an alternate course.

(d) Admission to following year of study

See H.1(d).

(e) Special examination

A student who fails a maximum of two courses in the final year of study, may be admitted to a special examination in those courses at the end of the first semester of the ensuing year, provided that a final mark of at least 40% has been obtained.

(f) Degree with distinction

The degree is conferred with distinction on a student who obtains an average of at least 75% in the following courses: Education 311 and 321; Subject Didactics Home Economics 413 and 423; School Practice 400; Interior 321; Home Management 410 and 420; Nutrition 320; Foods 320.

H.4 BACHELOR OF HOME ECONOMICS (HONOURS) [BHomeEcon](Hons)]
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Also consult General Regulation G.16.

The curriculum for the BHome Economics(Hons) degree makes provision for a choice between three possibilities:
Clothing Marketing, Food Management and General.

(a) Admission requirements

A BHome Economics degree.

(b) Duration

At least one year of full-time study or two years of part-time study.

(c) Curriculum

32 Credits at 700 level.

Depending on the choice of subject, one or more of the following subjects is a compulsory component of the honours course:

HSK 710 Socio-cultural studies (Cultural orientation)	3 credits
HSK 712 Socio-cultural studies (Consumer orientation)	3 credits
HSK 713 Socio-cultural studies (Development orientation)	4 credits
PRJ 781 Project 781 – compulsory for all	4 credits

A student chooses additional honours subjects to a maximum of 32 credits. Students who choose Subject Didactics: Home Economics (VHK 721) must also, as compulsory subjects, take Didactic Pedagogics 710 and Subject Didactics 710 for 6 credits as part of their study programme.

Details are obtainable from the Head of the Department.

- (i) Clothing Management: (Code 02240512)
- (ii) Food Management: (Code 02240031)
- (iii) General: (Code 02240041)

(d) Progress and pass requirements

- (i) A student must obtain a semester/year mark of at least 40% to be admitted to the examination in these courses. A sub-minimum of 40% is required in the examination.
- (ii) A semester or year mark is not required in certain courses, in which case an examination mark of at least 50% is required. These cases are specifically brought to the students' attention in the Departmental Manual.
- (iii) To pass, a final mark of at least 50% is required.
- (iv) Before the degree is conferred, Statistics 110 or a similar course must be passed.

(e) Degree with distinction

The degree is conferred with distinction on a student who obtained a final mark of at least 75% in the course.

H.5 MASTER OF HOME ECONOMICS (MHomeEcon)

(a) Admission requirements:

BHome Economics degree.

(i) Code 02250021: By virtue of a dissertation

HHK 890 (64 credits)
Two years full-time study.

First year of study

32 Credits at 700 level from courses in the group Clothing - Textile Studies, Interior, Foods - Food Service Management, Home Management - Extension and Home Economics.

Second year of study

32 Credits composed as follows:

HTP 810: Theoretical Perspectives	(4 credits)
NME 814: Research methodology	(8 credits)
HHK 890: Dissertation	(20 credits)

Passing a statistics course during undergraduate or postgraduate study, is compulsory, if a dissertation is done according to the quantitative approach. Students who already have a BHomeEconomics (Hons) degree, may apply for exemption from certain first year subjects.

**(ii) Code 02250022: By virtue of course work and an essay.
(64 credits)**

Two years of full-time study.

First year of study

32 Credits at 700 level from courses in the group Clothing - Textile Studies, Interior, Foods - Food Service Management, Home Management - Extension and Home Economics.

Second year of study

HTP 810: Theoretical Perspectives	(4 credits)
NME 814: Research methodology	(8 credits)
NPJ 820: Research project (essay)	(8 credits)

12 credits from subjects at 800 level, from courses in the group Clothing-Textile Studies, Interior, Foods-Food Service Management, Home Management-Extension and Home Economics.

Passing a statistics course during undergraduate or postgraduate study, is compulsory, if a dissertation is done according to the quantitative approach.

Students already in possession of a BHome Economics(Hons) degree, may apply for exemption from first year courses.

H.6 DOCTOR OF PHILOSOPHY (PhD) (Code 02260671)

Also consult General Regulations.

Subject to the stipulations of Regulation G.45 a Master of Home Economics degree is required.

Home Economics 900: HHK 900

Thesis: HHK 990

SYLLABI FOR DEGREES IN HOME ECONOMICS

(APP 120) Equipment Studies 120 (2 lectures)

Choice, purchase, functioning and use of electrical equipment for domestic use.

(APP 121) Equipment studies 121 (3 lectures)

Choice, purchasing, principles of operation, use and maintenance of electrical household appliances for smaller and larger households. A study of materials used – influence on service life, functional attributes. Appropriate technology, cost factors, energy consumption, correct use of electricity.

(APP 210) Equipment Studies 210 (2 lectures)

Choice, purchase, care and use of non-electrical equipment for domestic use.

(APP 211) Equipment studies 211 (3 lectures)

Choice, purchasing, use and maintenance of non-electrical household equipment for smaller and larger households. A study of materials used.

(BEH 221) Housing 221 (3 lectures)

The interaction of the individual, family or group with the micro and macro housing environment to the satisfaction of human needs and values.

(ERG 110) Ergonomics 110 (2 lectures + 1 x 1 hour p.)

Human cost of work in terms of emotional, cognitive, time and physical demands. Optimisation of job satisfaction and productivity.

(FSG 110) Physiology 110 (3 lectures p.w.) (presented by the Department of Physiology)

Introduction to the study of Physiology, Chemical principles, Cell and tissue, Neurophysiology, Haematology, Body fluids, Cardiovascular Physiology.

(FSG 120) Physiology 120 (3 lectures p.w.) (presented by the Department of Physiology)

Respiration, Digestive system and Metabolism, Kidneys and Acid-base equilibrium, Endocrinology, Reproductive Physiology, Skin and Body temperature.

(GSS 310) Family Studies 310 (2 lectures)

Casting and responsibilities of roles and development tasks of members of the family during the family cycle.

(HBS 410) Home Management 410 (3 lectures)

The household as a management unit.

(HBS 420) Home Management 420 (3 lectures)

Personal financial management and the management of household finances.

(HHK 480) Project Home Economics 480 (2 lectures)

The application of home economics in problem-solving and case studies.

(KLD 220) Clothing 220 (4 lectures)

Social-psychological aspects of clothing behaviour at personal and interpersonal level as well as from a human development perspective.

(KLD 310) Clothing 310 (3 lectures)

Clothing as a form of expression of collective and individual behaviour from a socio-cultural point of view.

(KLD 410) Clothing 410 (3 lectures)

Fashion from the viewpoint of the couture and ready-to-wear industry. The individual as consumer of textile goods and clothing.

(KLD 420) Clothing 420 (3 lectures)

The theory and procedures in the planning, purchasing and control of inventories for the profitable management and operation of a textile or clothing production line, department or shop, considering present and future fashions. Implementation of computer technology with regard to planning and control in a clothing enterprise.

(KLD 412) Clothing 412 (3 lectures)

The theory and procedures regarding the planning, establishment and operation of small-scale clothing production and sales.

(KLD 421) Clothing 421 (2 lectures + 1 x 3 p.)

The application of small-scale clothing production and sales in problem-solving and case studies by means of seminars, group discussions and literature studies.

(KLK 120) Clothing Construction 120 (1 lecture + 2 x 3 hour p.)

A problem-solving approach to basic clothing construction techniques and processes on different clothing materials.

(KLK 210) Clothing Construction 210 (1 lecture + 2 x 3 hour p.)

A problem-solving approach to advanced clothing construction techniques.

(KLK 220) Clothing Construction 220 (2 lectures + 2 x 3 hour p.)

Visual communication techniques, the design of basic and other patterns by means of flat pattern design and draping on half and full-scale. Grading of patterns.

(KLK 310) Clothing Construction 310 (2 lectures + 2 x 3 hour p.)

Design, planning and making of outfits taking into account fashion, the figure, fabric, cutting techniques and equipment.

(OBG 110) Principles of Design 110 (2 lectures + 1 x 2 hour p.)

An introduction to the basic principles of design by use of the design elements.

(ONT 221) Design 221 (2 lectures + 1 x 3 hour p.)

Study of the aesthetics of clothing. This includes clothing as an art object and a form of expression.

(ONT 311) Design 311 (2 lectures + 1 x 3 hour p.)

Analysis of historical clothing as an inspiration for design.

The application of basic principles of design in figure studies and style representations.

(SEM 180) Seminar 180 (2 lectures + 1 x 2 hour p.)

Analytical approach to the reading of scientific articles and the writing of an assignment. The computer as aid.

(SEM 212) Seminar 212 (3 lectures)

Professional orientation. The origin and development of home economics as occupational field. Public performance.

(SEM 216) Seminar 216 (2 lectures)

Seminar sessions aimed at process and product as expected in ITO 400 and in preparation for the integration of theory and practise. Practise management and general principles of Contract Law, Contract of Services laws and Arbitration laws.

(SEM 481) Seminar 481 (1 lecture)

Professional orientation and organised liaison and integration with the practice.

(TKS 210) Textiles 210 (3 lectures + 1 x 2 hour p.)

Textiles with a view to the consumer's choice. Textile terminology, classification, structure, properties and behaviour of fibre; threads; textile care and labelling. (Admission to examinations: A sub-minimum of 40% in both the theory and practical work is required.)

(TKS 220) Textiles 220 (3 lectures + 1 x 2 hour p.)

Textiles with a view to the consumer's choice. Properties and behaviour of different fabric structures and finishing. Implications for care: Colouring, printing and other methods of decoration. (Admission to examinations: A sub-minimum of 40% in both the theory and practical work is required).

(TKS 320) Textiles 320 (2 lectures + 1 x 2 hour p.)

Evaluation of household or textile products from a marketing and consumer viewpoint.

(VBG 321) Consumer Behaviour 321 (3 lectures)

The behaviour of consumers during consumer decision-making and the consumer-reaction to market indicators.

(VDB 320) Food Service Management 320 (4 lectures + 1 x 3 hour p.)

Planning of food service units: layout analysis, sound control, lighting, colour, thermal environment, floor and wall finishes and functional work areas. Different food service

systems. Principles in the choice and purchase of large-scale equipment and apparatus. Hygiene and safety. Personnel management. Systems approach to food service management, role of food service manager/supervisor, food service policy, process of employment, orientation and training, motivation and assessment of performance.

(VDB 410) Food Service Management 410 (3 lectures + 1 x 3 hour p.)

Evaluation of a food service unit for a particular situation. Computer applications in food service management, quality management, supervision in food service units and production function in food services. Purchase specifications for equipment. Personnel management.

(VDB 411) Project Food Service Management 411 (1 x 2 hour p.)

Application of Food Service Management in problem-solving and case studies, through seminars, group discussions and textual studies.

(VDG 120) Nutrition 120 (3 lectures)

Socio-cultural factors that influence the forming of eating habits. The study of the eating habits of the different culture groups in Southern Africa. The use of dietary guides evaluating eating habits.

(VDG 211) Nutrition 211 (3 lectures + 1 x 2 hour p.)

Recommended daily dietary allowances - origin and application. Study of nutrients with regard to food sources, functions, metabolism, symptoms of deficiency, RDA recommendations. Energy metabolism. Theory of menu and meal planning.

(VDG 212) Nutrition 212 (4 lectures + 1 x 2 hour p.)

Recommended daily dietary allowances - origin and application. Study of nutrients with regard to food sources, functions, metabolism, symptoms of deficiency, RDA recommendations. Energy metabolism. Theory of menu and meal planning. Physiological foundations of nutrition.

(VDG 320) Nutrition 320 (3 lectures + 1 x 2 hour p.)

The role of nutrition in the life cycle. Specific problems related to nutrition, inter alia, tooth decay, obesity. Nutrition of the sportsman. Different conditions of malnutrition. Crash diets.

(VDS 110) Foods 110 (3 lectures)

Availability and utilisation of Foods. Choice and purchasing of Foods: quality and quantity control. Grades, packaging, labelling with special reference to additives, trade names, price. Selection of Foods with production, portions and purpose of use and special marking.

(VDS 111) Foods 111 (2 lectures)

Choice and purchasing of foods. Quantity and quality control. Grading, packaging and labeling. Brands, trade names, price factors. Selection in terms of availability, purpose, price, portions.

(VDS 210) Foods 210 (3 lectures + 1 x 3 hour p.)

The composition and physical properties as well as the factors that influence the preparation of the following Foods: starch and grains, sugars, fruit, vegetables and different baked products. The study of the influence of different cooling and freezing techniques on Foods.

(VDS 221) Foods 221 (3 lectures + 1 x 3 hour p.)

The composition and physical properties, as well as the factors that influence the preparation of the following Foods: meat, fish, poultry, milk and milk products. The study of

the different Food systems with reference to the role that they play during the preparation of Foods.

(VDS 310) Foods 310 (5 lectures + 1 x 3 hour p.)

Experimental methods that are used in Food science and through which the chemical and physical reactions of Foods on methods of preparation and handling, are illustrated. Evaluation of quality properties of products. Safety in Foods and the prevention of Food poisoning.

(VDS 320) Foods 320 (3 lectures + 2 x 3 hour p.)

Theory of menu planning and application for the family and different groups. Selection and writing of recipes. Theoretical grounding for recipe standardisation and sensory evaluation of Foods. Preparation and serving of family meals, meals on large scale.

(VDS 413) Foods 413 (3 lectures + 1 x 3 hour p.)

Development of recipes and Food products. Recipe standardisation for large scale Food preparation. Foods styling and Foods photography.

(VDS 422) Project Foods 422 (1 lecture + 2 x 3 hour p.)

Objective methods of evaluation used in Foods research. Planning and execution of a research project in Foods.

(VDS 423) Foods 423 (2 lectures)

Food selection and meal planning for smaller and larger households.

(VHK 400) Subject Didactics: Home Economics 400 (2 lectures + 2 x 2 hour p.)

(VHK 400) Subject Didactics: Home Economics 400 (1 lectures + 1 x 2 hour p.)

(VHS 400) Subject Didactics: Hotelkeeping and Catering 400 (1 lectures + 1 x 2 hour p.)

The importance of effective management techniques for hotel organisations and restaurants in the hospitality services. Mastering of subject terminology, communication and social skills. Industrial relations, involvement in community development and preparation techniques.

(VLG 310) Extension 310 (1 lecture and 1 x 3 hour p.)

Adult education theory and practice for application in community development.

(VLG 320) Extension 320 (1 lecture and 1 x 3 hour p.)

Community development: programme planning, execution and evaluation.

(VLG 321 Extension 321 (3 lectures en 1 X 3 hour p.)

Community development, programme planning, execution and evaluation. Presentation in project format.

COURSES OFFERED OUTSIDE THE FACULTY

Faculty of Humanities

Anthropology (APL 151,152, 153, 154, 252, 252, 253, 254, 351, 352, 353, 354); Cultural History (KTS 100-vlak); Art History (KGK 151, 152, 153, 154, 251, 252, 253, 254, 351, 352, 353, 354); Social Work (MWC 101, 201, 301) (Social Group Work, Community Work.)

Nat, Agric and Info Sciences I

Psychology (SLK 151, 152, 153, 156,251, 254, 255, 256, 351, 352, 353, 354); Sociology (SOC 151, 152, 153, 154, 252, 252, 253, 254, 351, 352, 353, 354)

Syllabi: Faculty of Natural, Agricultural and Information Sciences

Introductory Microbiology (MBY 120,425);

Food Science (VDW 222, 314, 324, 432);

Syllabi: Faculty of Economic and Management Sciences

Marketing Management (BEM 151,152, 161, 162; 210, 220; 310, 320); Business Law (BER 251, 252, 261, 262) Economics (EKN 151, 152, 120); Financial Accounting (FRK 151, 152); Business Management (OBS 151, 152, 161, 162; 261, 262; 351, 352, 361, 362) Statistics (STK 151, 152 en 161)

Syllabi: Faculty of Education

Education (OPV 111, 121, 211, 221, 311, 321)

Subject Didactics of Science (VAN 400)

MEDALS AND PRIZES

Name	Donor	Award
Meiring Naudé Medal	Dr S M Naude	For the best student who obtained at least 75 % in all the theoretical practical courses for the BSc(Hons) with specialisation in Physics.
AEC Book Prizes	AECI	<ol style="list-style-type: none"> 1. Best achievement in Chemistry at 300 level. 2. Best achievement in Chemistry at BSc(Hons) level.
Sentrachem Book Prizes	Sentrachem (Pty) Ltd	<ol style="list-style-type: none"> 1. Best achievement in Chemistry at 300 level. 2. Best achievement in Chemistry at BSc(Hons) level.
Merck Prize	Merk(Pty) Ltd	Best achievement in Chemistry at 300 level.
Sasol Prize	Sasol Ltd	<ol style="list-style-type: none"> 1. Best achievement in Chemistry 131 and 141, on condition that the student continues studies in Chemistry. 2. Best achievement in Chemistry at 200 level, on condition that the student continues studies in Chemistry. 3. Best achievement in Chemistry at 300 level. 4. Best achievement in Chemistry At BSc(Hons) level..
Department Chemistry Prize		<ol style="list-style-type: none"> 1. Best achievement in Chemistry 131 and 141. 2. Best achievement in Chemistry at 200 level.
Dewald Hattingh Book Prize	Mrs ASJ Hattingh	For the best third-year student in Mathematics.
Lecturers' Prize in Geography	Dept. Geography, UP	Third year student with the highest marks in Geography during the three undergraduate years of study.
Jan F Celliers Bursary	Dr IB Celliers	<p>To a student in the first, second and third year, who takes Geology as main subject – according to academic achievement and financial need.</p> <ol style="list-style-type: none"> 1. Student at 100 level who achieves 66 credits concurrently with an average of 60%. 2. Student at 200 level who achieves 56 credits concurrently, of which 28 in Geology, with an average of 60%. 3. Student at 300 level who obtains 56 credits concurrently, of which at least 32 in Geology, Exploration Physics or Engineering Geology, with an average of 60%, and on condition that the

Name	Donor	Award
		student continues the studies in Geology.
Eskom Achievement Award	ESKOM	Best achievement in the final year of Earth Sciences.
Pierre du Plessis Prize	A group of friends and family of the late Pierre du Plessis.	Student in Physics at 300 level, on condition that the student passes with distinction.
SANLAM Prize	SANLAM	Best second year student in Mathematics.
SA Mathematics Society Medal	SA Mathematics Society	Best honours student in Mathematics or Applied Mathematics.
CSSA Prize	Computer Society of South Africa	Best achievement at 300 level in Computer Science.
ISIS Software Engineering Prize	ISIS	Best project in software by a group of final year students in Computer Science.
Saambou Bank Prize	Saambou Bank	Best achievement at honours level in Geography.
Department Home Economics		
Anniqne Theron Achievement Prize	Anniqne Theron	Top achiever in Home Economics General
Husqvarna Achievement Prize	Nordic Sewing Machines	Best achievement in VLG 310,320 concurrently.
Bernina Achievement Prize	Bernina Saskor, JHB	Achievement in Garment Construction 310 (Theory and Practice).
Bernina Achievement Prize	Bernina Saskor, JHB	Best achievement in Garment Construction 310 (practice).
Bernina Achievement Prize	Bernina Saskor, JHB	Best achievement in Clothing Construction 310 (design and creativity).
John Orr Achievement Prize	John Orr	Top achiever in Home Economics: Clothing Management.
Benjamin Woollens Achievement Prize	Benjamin Woollens	Top achiever in Clothing Construction 310 (theory and practice).
Rees Mann Achievement Prize	Mannettes, JHB	Best student in the commercial production component of Clothing Construction 310.
Not limited to the Faculty of Science		
SRC Honorary Medal	Student Representative Council	Student who delivered the best service to the community.

Name	Donor	Award
S ₂ A ₃ Bronze Medal	South African Society for the advancement of science (donor: Sentrachem Ltd)	To a student who completed an extremely good master's study in the field which is traditionally part of the activities of the South African Society for the Advancement of Science (S ₂ A ₃) members of the Convocation of the University of Pretoria.
Certificate of the Vice-Chancellor and Principal		Best achievement in all the undergraduate years of study in any field of the Sciences.
Medal of the Vice-Chancellor and Principal		Best achievement in all the undergraduate study years in any scientific field at the University of Pretoria.

The Afrikaans text of this publication is the official version and will be given precedence in the interpretation of the content.