University of KwaZulu-Natal

Faculty of

Science

Howard College Campus

2004

THE MERGER OF THE UNIVERSITIES OF DURBAN-WESTVILLE AND NATAL

The Universities of Durban-Westville and Natal merged on 1 January 2004. This means that the university at which you have registered is the merged institution University of KwaZulu-Natal.

The merger of the two institutions is seen as an exciting opportunity to create a new, truly South African university which is committed to excellence in teaching and in research. The Mission and Vision Statement for the new institution states:

> "We are committed to building a university that is academically excellent, critically engaged and demographically representative out of a regional system shaped, divided and disadvantaged by apartheid. The creation of a new institution is seen as an exciting opportunity that will allow the region to bring into being a genuinely South African university with a new culture and form, designed to meet the challenges of serving the country and the region in innovative and effective ways. This socially responsive institution will be a world-class institution and an active global player while still serving the KwaZulu-Natal and southern African region."

The new institution will continue to offer existing programmes under existing academic rules until these are amended or restructured by the new Council. This means that the existing programmes at both institutions will be offered to new students in 2004 on the same basis as they are offered at present. There will be some instances where offerings are modified by agreement between the two universities, but in these cases you will be informed of such modifications before the commencement of your studies in 2004.

It is probable that the current organization of faculties and schools will change in 2004, but all the various disciplines that constitute these faculties and schools at present will still exist. Some programmes may relocate to another campus during 2005.

What does this actually mean to you?

- That the new university is committed to ensuring excellent academic standards;
- That you will be able to obtain your degree in whichever programme of study currently on offer for which you register;
- That the new University rates students' interests of major importance and will ensure that any changes to your programme of study will be made in the interests of educational quality.

Note: ***The University reserves the right from time to time to add to, withdraw or amend in any manner, its rules, and any such additions, withdrawals or amendments shall become binding upon the date of publication or upon such date as may be specified by the Senate and the Council.***

FACULTY OF SCIENCE

HOWARD COLLEGE CAMPUS

HANDBOOK FOR 2004

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HD=Head of Discipline, PD=Programme Director, CR=Chair, DR=Director, MR=Manager

INFORMATION FOR STUDENTS

Qualifications offered in the Faculty of Science

The following courses are offered in the Faculty of Science:

(a) A three-year course leading to the degree of Bachelor of Science (BSc). This may be achieved through a general formative programme of study or through a focused programme of study around an area of specialisation. In the latter case the field of specialisation is indicated after the words *Bachelor of Science* or contraction BSc, e.g. BSc in Bio-Medical Sciences.

(b) A four-year course (known as the *Augmented Curriculum*), also leading to the degree of Bachelor of Science.

(c) A one-year postgraduate specialist course following the BSc for the degree of Bachelor of Science Honours (BScHons).

Note: **Under special circumstances, a student who has completed post-matriculation courses may be admitted to the second year of study and may complete an Honours degree in three years. As the subjects offered must meet the requirements of the Honours curriculum to be followed, the prior approval of the Dean must be obtained.**

The following postgraduate research degrees are offered:

(a) Following on the BScHons, a research programme towards the Master of Science (MSc), lasting a minimum of one year, and showing that the candidate is able to use the methods of research in his or her discipline. Examination is normally by thesis only.

(b) In certain disciplines, the MSc degree may also be obtained through a programme of advanced study and research, with coursework contributing up to 50% of the total required credit and a dissertation the remainder.

(c) Following on a BScHons (or an acceptable Honours degree from another faculty) in an aspect of environmental studies, a one-year programme of advanced study and research leading to the degree of Master of Environmental Management; or to the degree of Master in Marine and Coastal Management. The coursework and dissertation each contribute to the credit.

(d) A research programme towards the Doctor of Philosophy (PhD), lasting a minimum of two years, and showing that the candidate has carried out a programme of original research.

(e) A Doctor of Science (DSc) degree awarded on the basis of original published work carried out over a number of years.

UNDERGRADUATE

Selection of Courses

The Dean, the Assistant Deans (Students) and representatives of academic Schools attend on the registration days at the beginning of the academic year to give advice to students on the choice of curricula. All students in the Faculty must have their curricula approved by the Dean and curricula may be changed only in consultation with the Dean.

A limited number of students may, at the discretion of the Dean, be admitted to the Augmented Curriculum. This curriculum is intended for students with disadvantaged school backgrounds who nevertheless show a potential for success.

The following subjects are offered in the Faculty (Economics, Psychology and Geomatics are offered by Schools in other Faculties). The Roman numerals indicate that level-1 modules (I), level-2 modules (II) or level-3 modules (III) are offered as part of these subjects.

Actuarial Science (I,II, III)
Applied Chemistry (II, III)
Applied Mathematics (I, II, III)
Cellular Biology (I, II, III)
Chemistry (I, II, III)
Computer Science (I, II, III)
Economics (I, II, III)
Environmental and Engineering Geology (II, III)
Environmental Biology (I, II, III)
Environmental Management (I, II, III)
Environmental Science (I, II, III)
Geography (I, II, III)
Geology (I, II, III)
Geomatics (I)
Mathematics (I, II, III)
General Mathematics (I)
Physics (I, II, III)
General Physics (I)
Psychology (I, II, III)
Scientific Writing & Reporting (I)
Statistics (I,II,III)

These subjects are made up of a number of component modules as shown in the School syllabuses. They may be chosen provided that appropriate prerequisite requirements are met as specified in the syllabuses. The Faculty has a number of streams with differing entrance requirements. Not all subjects are offered in every stream.

Curriculum Design

The academic year is divided into two semesters. The first semester runs from February to June and the second from August to November. A number of modules (involving fieldwork) are also given in the Winter semester (during the mid-year vacation).

Modules are examined in the semester in which they are given. Each module passed earns a number of credit points which is related to the work load involved in the module – one credit represents 10 notional study hours, which is in general made up of both contact time (lectures, seminars, laboratory sessions, tutorials, field trips, etc.) and self-study by the student.

(Notional Study Hours legend: L=lectures, T=tutorials, P=practicals/field trips, S=seminars, R=revision, H=self-study, F=internship, A=assessment and exams).

Certain modules in the Augmented Curriculum contain considerably more material than is reflected in their credit-point ratings. This additional foundational material is designed to correct the effects of a disadvantaged schooling.

The BSc degree will be awarded to a candidate who has acquired a minimum of 384 credit points provided that these are acquired under the conditions laid down in the *Rules for Degrees* or in the rules for the particular Programme concerned.

In designing a degree curriculum the most important points to note are

(1) The framework of the degree as set out in Rule SD6 and the limitation on the number of modules that may be taken in any semester in Rule SD8 (see section headed *Rules for Degrees*).

(2) Some modules have *prerequisite* or *co-requisite* modules. The meanings of these terms are given under *definitions* in the *Rules for degrees*. Details of co-requisites and prerequisites are contained in the *Schools* section of this Handbook.

(3) Some schools offer as many as 128 credit points at level III. This allows candidates to orientate their degrees strongly toward a single subject.

(4) No curriculum which conflicts with the constraints of the timetable will be approved, except by special permission of the Dean.

(5) Because of the requirements of Rules SD3, SD6 and SD11, a first-year curriculum must be designed to lead on to Level II and Level III modules which are suitable for the completion of a degree. It should be noted that the restrictions of the timetable and the modular structure make it impossible or very difficult to construct a curriculum which allows the student to transfer to certain other faculties or degree courses (such as Pharmacy, Optometry or Medicine) in this University, other universities, technikons or other tertiary institutions.

(6) The modules comprising an Augmented Curriculum will be determined by the Dean or an Assistant Dean (Students) in consultation with the student.

Module Nomenclature and Codes

Associated with each module there are a long name (e.g. *Inter. Analytical Chem* or *Parasites and People*), a short name (e.g. *Chem 2A1* or *Biol 2P1*) and a module or course code (e.g. *DSC2CA1* or *DSB2EH1*). The module code is the definitive administrative tool and it is structured as follows:

The first three letters represent the Centre (Durban), the Faculty (Science) and the discipline (e.g. C for Chemistry, X for Computer Science). The fourth character represents the level of the module (1, 2, 3, etc.). The next two alphanumerical characters represent the module – usually, although not always, there is an attempt to choose a meaningful pair of letters associated with the module name). The last character gives the semester in which it is offered – M when it may occur in either semester, depending on circumstances (particularly relevant for Honours modules), B when it is offered (repeated) in both semesters, and Y if it runs over the year. (Where modules are to be offered in either the first or second semester but not both, the semester to be used will always be announced in good time.)

Entrance to the Faculty

BSc Degree

Students entering the Faculty can enter one of two streams (M and G) with the entrance requirements given below. Students who fail to meet these requirements may still be admitted if they have qualities or qualifications which, in the opinion of the Dean are equivalent to those listed. Students who qualify for stream M can take any major subjects or modules offered by the Faculty.

Stream M

This stream is intended for students whose curricula require them to register for Mathematics 1S1 and 1S2, that is students of the mathematical, physical or computer sciences. Students must have an average of at least a C at higher grade in their best six matriculation subjects (excluding Advanced Mathematics), i.e. 32 matric points, and must have at least a D at higher grade in matriculation Mathematics and at least an E at higher grade in Physical Science or Biology. Students of other Sciences (Chemistry, Biology, Geology, Environmental Science, Geography etc.) may also opt for these Mathematics modules, and many do, if they satisfy the entrance requirements of the M stream.

Stream G

This stream is intended for students of the other sciences, such as Biology, Chemistry, Geology and Environmental Science. Students must have an average of at least a C at higher grade in their best six matriculation subjects (excluding Advanced Mathematics), i.e. 32 matric points, and must have at least an E at higher grade in

matriculation Mathematics and at least an E at higher grade in Physical Science or Biology.
Students from other Faculties who wish to take a module in the Faculty of Science must meet any entrance restriction placed on that module. In particular, entry to Level I Mathematics, and modules which have it as a co-requisite, requires a matriculation pass in Mathematics of at least D at higher grade.

Four-Year BSc Degree (Augmented Curriculum)

Students who have had a disadvantaged school background may be admitted to this curriculum with lower matriculation qualifications or if they have been recommended by an approved selection course which identifies them as having the potential to succeed. If they have not been through a special selection course they must normally average at least a D at higher grade over their best six matriculation subjects (excluding Advanced Mathematics). A good performance in at least one of Mathematics, Physical Science or Biology is also required for selection.

Specific Programmes

It should be noted that, at the discretion of the Dean, somewhat modified entrance requirements may be applicable to certain focused programmes. In particular, students choosing to follow the focused programmes in Mathematical & Statistical Sciences, Actuarial Science or Information Technology may offer Computer Studies in place of Science or Biology, while for the purposes of entry into the focused programmes in Environmental Science and in Geography & Environmental Management, a higher grade E in Geography may replace the Biology/Physical Science requirement.

Bachelor of Science Degrees

The Faculty of Science introduced a number of focused programmes in 2000. In addition to the well-established, multi-facetted and flexible Bachelor of Science (BSc) degree, specific career-oriented, focused programmes in various areas of specialization are also available. These are:
Bachelor of Science in Actuarial Science
Bachelor of Science in Biological Sciences
Bachelor of Science in Bio-Medical Science
Bachelor of Science in Computer Science and Information Technology
Bachelor of Science in Environmental Science
Bachelor of Science in Geocomputing
Bachelor of Science in Geography & Environmental Management
Bachelor of Science in Geological Sciences
Bachelor of Science in Mathematical & Statistical Sciences
Bachelor of Science in Pure & Applied Chemistry

Bachelor of Science (BSc)

The BSc degree allows students to design a curriculum to suit their particular interests and requirements, subject to certain constraints. In fact, it is the only manner in which certain disciplines or combinations of disciplines can be studied, such as Cellular Biology and Chemistry, or Physics and Mathematics, or Statistics and Economics, or Computer Science with Economics or Psychology.

All degrees require a minimum of 384 credits for a degree, and a students normally takes 128 credits each year. Each subject (such as Physics or Geology) is made up of a number of modules, and each module is given a credit rating based on the number of lectures, tutorials and practicals in the module. A typical semester-long module is worth 16 credits, and students normally study four of these 16-credit modules per semester. In their first year students usually take modules from four different disciplines but at higher years would select more modules from two or three subjects (called major subjects). Students may choose to take 2 majors, e.g. Cellular Biology and Chemistry, or they may prefer to have one full major (64 credits) with the remaining 64 credits taken from more than one discipline, eg. Applied Maths as major (64 credits), together with 32 credits each from Computer Science and Physics.

Focused Programmes

The focused programmes represent part of a national drive to ensure that more students have suitably-structured courses which either lead to a career or to a clearly defined path of academic development. Some of these programmes represent existing popular choices amongst the possible degree structures available within the BSc options. Others have been formulated in an attempt to provide exciting new academic offerings leading to specific careers. In general they all have focused structured curricula, although some offer almost as much flexibility of choice, within some constraints, as does the BSc.

Places in certain modules may be restricted and this may affect a student's ability to continue with a particular programme of study.

There are currently eleven different focused Programmes on offer in the Faculty. However, not all programmes will necessarily be offered at any time. They are as follows:

School of Life and Environmental Sciences

BSc in Biological Sciences

This Programme provides an education in the broad life sciences. The curriculum at Level I includes three modules in Biology and two modules in Chemistry. At levels II and III compulsory modules are laid down, together with electives from a range of Biology modules. There is also scope for a limited number of free elective modules. A research project is a feature of the third year of study. The entrance requirements are those of the G-Stream.

BSc in Bio-Medical Sciences

This interdisciplinary Programme is geared towards the applications of fundamental biology to various medical science fields. The curriculum is tightly constrained, with no elective modules possible until the third year of study. In the first year of study it involves five compulsory modules as for the BSc in Biological Sciences, together with a Maths module, a Physics module and a basic Physiology module. Selection of students into the Programme will take place at the end of the first year of study. At higher levels there is a mixture of Cellular Biology and Medical Science modules. A research project is a feature at level III. The entrance requirements are 42 matric points, a higher grade D Mathematics and a higher grade C in Science and Biology.

BSc in Environmental Science

This flexible interdisciplinary Programme recognises the importance of educating generalists with a strong science basis and an understanding of the management of the environment. It offers curricula in three different streams with an emphasis on the perspectives of the Life Sciences, the Earth Sciences or Chemistry. There is roughly an 80:20 balance between the natural science and the social science side of environmental studies. Chemically-based studies play a fundamental role in Environmental Science, and hence all students are required to take two level I Chemistry modules as well as the level II module in Environmental Chemistry. Compulsory modules related to the chosen scientific stream augment these modules. In addition, general environmental studies are represented through the level I modules in Urban Environments and Environmental Geography, and higher level modules in Environmental Assessment, Management, Auditing, and Law or Economics, as well as in Geographic Information Systems. The curricula also allow for some electives from lists of options. For entry into this Programme, students require at least a higher grade E in Mathematics, and in one of Physical Science, Biology or Geography, and an average of at least a higher grade C overall.

BSc in Geography & Environmental Management

This interdisciplinary Programme is oriented towards Geography with a specialisation in Environmental Management. It encompasses a roughly 50:50 balance between the natural and the social sciences, particularly as they impact on the study of the environment and the management thereof. There is a strong emphasis on Geography, Environmental Science and Economics. In addition to level I modules in Environmental Studies and Economics, there is a requirement to include a module providing basic mathematical-statistical skills, and electives from the Earth Sciences, Environmental Biology and/or Chemistry. Modules in Environmental Studies and Economics are continued in level II, as well as electives from restricted lists. At level III there is a research project. For entry into this Programme, students require at least a higher grade E in Mathematics, and in one of Physical Science, Biology or Geography, and an average of at least a higher grade C overall.

School of Geological and Computer Sciences

BSc in Computer Science and Information Technology

This Programme aims at educating students in both theoretical and applied Computer Science, with the possibility of including the study of Information Systems & Technology. At level I students take compulsory modules in Computer Science and Mathematics and choose two of Operations Research, Statistics or Information Systems & Technology (IST). There is scope for two elective modules. At level II there are three compulsory modules in Computer Science, and at level III students must take at least four Computer Science modules out of eight that are offered. Should students wish to take level III modules in IST, they will have to plan their curricula so as to include level I modules in Economics. The entrance requirements are those of the M-Stream, except that a higher-grade pass in Computer Studies may replace the Physical Science/Biology requirement.

BSc in Geocomputing

This Programme aims at producing graduates who have expertise in both Geology and Computer Science, so that they can apply sophisticated computing methods to geological problems. The first year of study includes compulsory modules in Geology, Computer Science and Mathematics, together with two electives. At higher levels there are compulsory modules in Computer Science, Geology and Geographic Information Systems (GIS), as well as electives from restricted lists of options from Geology and Computer Science. The entrance requirements are those of the M-Stream.

BSc in Geological Sciences

This Programme aims at educating highly skilled geologists with expertise in various aspects of Geology and its applications. It is offered in two streams, viz. *Ore Deposits* and *Environmental and Engineering Geology*. Both include a compulsory set of level I Geology modules, together with one module of Chemistry and of Computer Literacy, and free electives. At level II the two streams diverge, although both streams require Mineralogy, Petrology, Structural Geology, and a Field Module, together with other designated modules for each stream. At both levels II and III there is scope for free electives. Entrance requirements are those of the G-Stream.

School of Mathematical and Statistical Sciences

BSc in Actuarial Science

This programme aims at preparing students for a career as an actuary or in related fields. Performance at an acceptable level may lead to exemption from certain of the subjects required for qualification as an actuary by the British Institute of Actuaries. The entry requirements are those of the M-stream, except that a higher grade pass in Computer Studies may replace the Physical Science/Biology requirement. A further requirement is an A in higher grade Mathematics.

BSc in Mathematical & Statistical Science

The purpose of this Programme is to produce graduates who have a good grasp of the underlying concepts and methods of mathematics and statistics and are capable of sound mathematical reasoning. They will have good problem-solving and communication skills in mathematics and statistics, and will be skilled in the use of computers for computational and other purposes.

At level I there are compulsory modules in Mathematics, Applied Mathematics, Statistics and Computer Science, while at level II Mathematics is compulsory. Level III modules must be selected from the disciplines of Mathematics, Applied Mathematics or Statistics and some Computer Science modules may also be included. Entry requirements are those of M-stream, except that a higher-grade pass in Computer Studies may replace the Physical Science/Biology requirement.

School of Pure and Applied Chemistry:

BSc in Pure & Applied Chemistry

This Programme is designed to produce highly qualified graduates in Chemistry and its applications in industry. In the first year of study there are two compulsory modules in each of Chemistry, Mathematics and Physics, together with electives. Some electives are possible in the second year, but modules at level III are all prescribed Chemistry and Applied Chemistry modules. The minimum entrance requirements are those of the G-stream.

General Information

Other Student Activities

Although the Faculty of Science encourages participation of students in all university activities, the holding of office in certain student organisations and committees can be extremely time consuming and may be incompatible with full-time study in certain disciplines. Students should only accept such positions or responsibilities after consultation with the Head(s) of the School(s) concerned.

Careers

Among careers open to graduates in Science are a variety of posts in commercial and industrial organisations, government departments, research institutes, higher education and the teaching profession. Students wishing to obtain professional registration with the SA Council for Natural Science Professions are required to complete at least a BScHons degree. Students wishing to follow research careers should complete at least the Honours degree (fourth year), and preferably the degree of Master of Science beyond that.

Prizes

The following prizes are available to students in the Faculty of Science:

Damant Science Prize:

Awarded for leadership and achievements in student activities in final year.	Value R1000

Life and Environmental Science Prize:

Norma Beare Memorial Fund prize for the best student in BSc Honours (Biology).	Book prize
Umbogintwini Operations Services prize for the best student in Chemistry I.	Value R500
Sasol prize for the best student in Chemistry II.	Value R750
Sasol prize for the best student in Chemistry III.	Value R1000
Sasol prize for the best student in Chemistry Honours.	Value R1500
Huntsman Tioxide prize for the best student in Applied Chemistry II.	Value R750
Merck prize for the best student in Applied Chemistry III.	Value R1000
Unilever/Lucas prize awarded to the best overall student in Chemistry.	Value R2000

Mathematics and Applied Mathematics prizes:

Awarded to the best students in:	
Mathematics I and Applied Mathematics I.	Value R500 each.
Mathematics II.	Value R750.
Mathematics III and Applied Mathematics III.	Value R1000 each.
Honours (Mathematics or Applied Mathematics).	Value R1000.

POSTGRADUATE

Honours and Postgraduate Programmes

The following Honours and postgraduate programmes are offered in the Faculty of Science:

(a) A one year specialist programme following the BSc for the degree of Bachelor of Science Honours. This programme is offered in the following streams:

- BSc Honours (Applied Mathematics)
- BSc Honours (Applied Physics)
- BSc Honours (Biological Sciences)
- BSc Honours (Biological Sciences with Chemistry)
- BSc Honours (Chemistry)
- BSc Honours (Computer Science)
- BSc Honours (Environmental and Engineering Geology)
- BSc Honours (Environmental Science)
- BSc Honours (Geography and Environmental Management)
- BSc Honours (Geology and Ore Deposits)
- BSc Honours (Marine Ecology)
- BSc Honours (Mathematics)
- BSc Honours (Physics)
- BSc Honours (Statistics)

An Honours project is an integral part of the Honours programmes and contributes between 16 and 48 of the total of 128 credits required for the degree. Candidates must obtain a pass mark of at least 50% for their projects.

In any Honours programme, candidates may, with the permission of the Head of School, replace up to 32 credits of elective material with modules from another Honours programme.

(b) Postgraduate coursework programmes in Environmental Science leading to the degree of Master of Science (Environmental Science); in Geography and Environmental Management leading to the degree Master of Environmental Management and in Biological Sciences leading to the degree Master in Marine and Coastal Management. These programmes consist of a coursework component comprising a number of modules, and a research project/report, each contributing towards the required credits.

(c) A research programme towards the Master of Science (MSc) in a variety of disciplines. It lasts a minimum of one year, and demonstrates that the candidate is able to use the methods of research in his or her discipline. Examination is by thesis.

(d) A research programme towards the Doctor of Philosophy (PhD), lasting a minimum of two years, and showing that the candidate has carried out a programme of original research.

(e) A Doctor of Science (DSc) degree is awarded on the basis of original published

work carried out over a number of years.

Selection Criteria

BScHons(qualifier) Degree

Students are selected on the basis of a sufficiently high standard of performance in the BSc degree.

MSc (qualifier) Degree

Students are selected on the basis of their performance in the BScHons degree. Alternative criteria for selection may be used in the case of students who have significant appropriate experience.

MEnvMgt Degree

Students are selected on the basis of their performance in the BScHons degree. Alternative criteria for selection may be used in the case of students who have significant appropriate experience. See Rule SDEM1.

MMarCoastMgt Degree

Students are selected on the basis of their performance in the BScHons degree. Alternative criteria for selection may be used in the case of students who have significant appropriate experience. See Rule SDMCM1.

MSc Degree

Students are selected on the basis of their performance in the BScHons degree provided that the School is able to provide supervision appropriate to the research topic. Alternative criteria for selection may be used in the case of students who have significant appropriate experience.

PhD Degree

Students are selected on the basis of their performance in the MSc degree provided that the School is able to provide supervision appropriate to the research topic. In some cases students who have made exceptional progress in the MSc may be allowed to change their registration to a PhD. Alternative criteria for selection may be used in the case of students who have significant appropriate experience.

DSc Degree

This degree is intended to recognize an extended period of significant published research by the candidate. It is normally only available to graduates or staff members of the University or those who have had a close association with the University over a number of years.

RULES FOR DEGREES

Definitions:

The following definitions apply to modules offered by schools in the Faculty of Science.

(1) ***Subject:***

Related course material that may be spread over several modules at one or more levels of study.

(2) ***Module:***

A course of study for which separate credit may be obtained. Modules shall be designated as being at Level I, Level II or Level III. The fourth character of the module code indicates the level of the module.

(3) ***Year of Study:***

A candidate is in the first year of study until at least 96 credit points have been obtained.

A candidate is in the second year of study when 96 credit points have been obtained, but the candidate has not yet registered for such modules as will, if passed, lead to the completion of the degree.

A candidate is in the third year of study when registered for such modules as will, if passed, lead to the completion of the degree.

(4)a ***Prerequisite module:***

A module in which a candidate has met all the requirements for the granting of a supplementary examination, or has obtained such higher mark as may be prescribed by a faculty, before admission to the module for which it is a prerequisite.

(4)b ***Co-requisite module:***

A module in which the examination must be written prior to or in the same semester as the module for which it is co-requisite.

(4)c Save by permission of Senate, credit must have been obtained for all prerequisite and co-requisite modules before the degree can be awarded.

Note: Admission to modules offered by other Faculties shall be subject to the approval of those Faculties.

SD1 Degrees Awarded

(i) The following degrees are conferred in the Faculty of Science:

Bachelor of Science	BSc
Bachelor of Science Honours	BScHons
Bachelor of Science Honours, with qualifier*	BScHons(**)
Master of Science	MSc
Master of Science, with qualifier*	MSc(**)

Master of Environmental Management	MEnvMgt
Master of Marine and Coastal Management	MMCM
Doctor of Philosophy	PhD
Doctor of Science	DSc

(ii) Except with the permission of Senate the following Rules for Degrees offered in the Faculty shall apply.
(iii) The University Common Rules for degrees, diplomas and certificates apply to this Faculty.

**Note:* *Degrees marked "with qualifier" indicate that the area of specialisation is defined and is included in brackets. This applies to BScHons and MSc by coursework and dissertation.*

Rules for The Bachelor of Science Degree

SD2 Entry Requirements

Candidates shall be eligible to register for the degree provided they have previously obtained passes of at least 40 percent (E) at the higher grade in Mathematics and passes of at least 40 percent (E) at the higher grade in Physical Science or Biology in the Matriculation, or equivalent, examination. Candidates intending to register for Mathematics 1S1 (DSM1SX1), shall have a Mathematics pass of at least 50 percent (D) at the higher grade. Candidates who have obtained passes in Mathematics and in Physical Science or Biology in the Matriculation or equivalent examination, but have not otherwise met the requirements set out above, may, in certain circumstances, be registered in the Augmented Curriculum leading to the completion of the degree in not less than four years.

SD3 Approval of Curricula

Candidates shall not be admitted to any module in any subject until their curricula have been approved by the Senate. An approved curriculum may be modified only with the consent of the Senate.

SD4 Minimum Degree Duration

Every curriculum for the degree shall extend over not less than six semesters; provided that candidates who are unable to give their full time to the curriculum for the degree, or are registered for an Augmented Curriculum (Rule SD2) shall devote not less than eight semesters to the curriculum.

SD5 Duly Performed (DP) Certificates

(i) Students shall not be allowed to present themselves for examination in any module unless the Head of the School in which they have studied that module has

submitted a certificate to the satisfaction of the Senate stating that they are qualified by attendance and have duly performed the work of the class.
(ii) Such DP certificates shall be valid for the examinations of the semester in which they are issued, and, with the consent of board of the faculty concerned, for the examinations, in the same modules, in any subsequent semester.
(iii) The DP requirements shall be posted upon a suitable notice board.
(iv) For each module a list of DP certificates awarded and refused shall be posted on a suitable notice board by the last day of teaching.

Note: Common Rule GR15 - Right of Appeal

SD6 Credit Point Requirements

The programme requires that a set of modules with a total credit value of at least 384 be passed, subject to the following conditions:
(i) of the 384 credit points, at least 352 shall be from modules in subjects given in Lists A, B or C below;
(ii) of the 352 credit points from the lists below, at least 224 shall be from modules at levels II and III;
(iii) of the 224 credit points at levels II and III, at least 128 shall be at level III; and
(iv) of the 128 credit points from modules at level III, at least 64 shall be in a primary major subject from List A, with the balance from modules in subjects given in Lists A or B;
(v) where modules not included in Lists A or B are designated as part of the curriculum of a specific programme, they shall be deemed to fall within Lists A or B, as appropriate, for that programme;
(vi) the minimum of 384 credit points may, subject to the approval of the Dean, contain elective modules with a combined credit value not exceeding 32, offered in any faculty.

List A (Primary major subjects):
Actuarial Science, Applied Mathematics, Biological Sciences, Cellular Biology, Chemistry, Computer Science, Environmental Biology, Environmental Science, Environmental and Engineering Geology, Geography, Geology, Mathematics, Physics, Statistics

List B (Other major subjects):
Applied Chemistry, Economics, Environmental Management, Psychology

List C (Non-major subjects):
General Mathematics, Geomatics, General Physics, Scientific Writing & Reporting, Human Body: Form and Function

Notes:
(1) Candidates offering Environmental Science as primary major shall not obtain credit for modules from Environmental Management taught by Schools outside the Faculty, except

in terms SD6(6) above (but see Note 3 below).

(2) Candidates are warned that not all possible combinations of Level III modules may be accepted by the Board to make up the 64 credit points required beyond the credit points associated with the primary major from List A.

(3) Computer Literacy A and B are not regarded as modules inside the Faculty. However, as one or the other is a required part of the curricula for Geology and for Environmental and Engineering Geology, they will be regarded as credits inside the Faculty for these curricula.

(4) Students can only major in one of the following 3 majors: Cellular Biology or Environmental Biology or Biological Sciences (which encompasses both).

SD7 Restriction on Level III Credits

Candidates may not include among the 128 credit points at Level III prescribed in terms of Rule SD6(iv) credit points for modules in a subject passed at equivalent level in fulfilment of the requirements of a degree obtained in another Faculty or for courses passed at another university, except with the permission of Senate.

SD8 Maximum Credits per Semester

Unless otherwise specified or with the permission of the Dean, a candidate shall not register for modules totalling more than:
(i) 64 credits per semester in the first two semesters of registration;
(ii) 80 credits per semester subsequent to the first two semesters of registration.

SD9 Pre/Co Requisites Modules

Candidates shall not:
(i) be permitted to register for any module unless all prerequisite requirements for the module have been satisfied; or
(ii) be awarded the degree before the co-requisite requirements for the component modules are satisfied.

SD10 Pass Mark

(i) The pass mark for all modules in the Faculty is 50 percent, the assessment being based on a weighted mean of marks obtained for one or more of the following: written, oral and/or practical examinations, practical work, tests, essays, seminars, reports and other classwork. A sub-minimum mark may be required in one or more parts of the assessment.
(ii) On passing the examination associated with a module, and having satisfied all prerequisite and co-requisite module requirements associated with the module, candidates shall receive the credit points listed in this handbook with the syllabus for that module.

SD11 Progression

Candidates who fail to maintain the following minimum rate of progress in their studies or who, at the end of any semester, are not able to propose a future curriculum acceptable to the Senate which will allow them to achieve this minimum rate of progress, may be excluded from the Faculty.

No of semesters completed	Full-time curriculum	Part-time curriculum	Augmented curriculum
1	16		8
2	64	32	48
4	128	80	112
6	200:48#	128	176:24#
8	280:88:32#	200:48#	248:88#
10	384*	280:88:32#	312:96:32#
12		384*	384*

The notation '200:48' indicates 200 credit points in total, of which at least 48 must be at level II. Similarly the notation '280:88:32' indicates 280 credit points in total of which at least 88 must be at level II and at least a further 32 must be at level III.

* Degree Complete

Note:

(1) If excluded, candidates may apply to the Dean, on the prescribed form, to be readmitted. Readmission will be granted only in special circumstances and candidates who are readmitted may be required to achieve additional targets.

(2) Periods of study in other faculties or at other universities may be taken into account when calculating the number of semesters of study completed.

SD12 Excluded Candidates

(i) Candidates excluded from the Faculty shall not be permitted to register for any module in the Faculty, including modules taken for "non-degree" purposes.

(ii) Candidates excluded from any other faculty or university will only be admitted to the Faculty of Science with the permission of Senate.

Note: See Common Rule GR19 Exclusion - Right of Appeal

SD13 Supplementary Examinations

(i) Any candidate who fails a module with a mark of not less than 40% shall be permitted to write a supplementary examination in the module provided that the module assessment includes a formal written examination.

(ii) Any candidate who passes a module but, because of a sub-minimum requirement may not proceed, shall be permitted to write a supplementary examination in the module

(iii) If the failed module is the outstanding module to complete a degree, and the candidate has obtained a mark of between 25% and 40% for a module, and not more

than 32 credits in supplementary exams have been granted, then the candidate shall be permitted to write a special examination in the module.

SD14 Oral Examinations

(i) Students may be required to present themselves for oral examinations in addition to such written and practical examinations as may be prescribed.
(ii) On the recommendation of the Head of School, with the approval of the Senate, a written examination may, for a particular student, be replaced with an oral examination

SD15 Cum/Summa Cum Laude

(i) The degree of Bachelor of Science shall be awarded cum laude to a candidate who:

(a) Completes the degree in the minimum prescribed period (except in special circumstances);

(b) obtains a weighted average mark of at least 75 percent in all modules required for the degree; and

(c) obtains a weighted average mark of at least 75 percent in a full set of level-III modules required for the degree.

Weights shall be assigned to modules in proportion to their credit values.

Note: The minimum prescribed period referred to in (a) shall be 6 semesters of study, except in the case of a part-time candidate, or one registered for the Augmented Curriculum (Rule SD2), when it shall be 8 semesters of study.

(ii) The degree of Bachelor of Science shall be awarded summa cum laude to a candidate who:

(a) fulfils the requirements of Rule SD 15(i);

(b) has not failed any module required for the degree; and

(c) obtains a weighted average mark of at least 80 percent in a full set of level-III modules required for the degree.

The note appearing under Rule SD15(i) also applies to Rule SD15(ii)

Rules for Honours and Postgraduate Degrees

Definitions

The following additional definitions apply to Honours and other Post-graduate modules offered by schools in the Faculty of Science.

Core module: a module for which credit must be obtained in order to fulfil the requirements for the degree.

BACHELOR OF SCIENCE HONOURS

SD16 Eligibility

Candidates shall be eligible to register for the degree of Bachelor of Science Honours provided they have previously:
(i) satisfied the requirements for the degree of Bachelor of Science in the University or been admitted to the status thereof; or
(ii) been admitted by permission of the Senate as a candidate for the degree in terms of Common Rule GR7.

SD17 Programme of Study

Candidates shall pursue an Honours course of advanced study in a subject approved by the Senate. The curriculum shall consist of a number of modules totalling 128 credits, from or related to the subject, as approved by Senate, and shall include an Honours project of at least 16 credits.

SD18 Prerequisites

The subject of an Honours programme shall be one in which the candidate has completed all prerequisites for entry to the Honours programme.

SD19 Admission

The Senate may refuse to admit candidates to an Honours programme in any subject if the standard of proficiency which they have previously attained in that subject is not sufficiently high.

SD20 Ancillary Subject

The Senate may require candidates to complete a module in any prescribed subject as ancillary to the subject which is offered for the degree.

SD21 Degree Duration

(i) Candidates shall be required to present themselves for all parts of the final examination in two successive semesters except that part-time students shall be required to present themselves for all parts of the final examination over four successive semesters.
(ii) Candidates who, at the end of any semester, are not able to propose a future curriculum acceptable to the Senate which will allow them to complete their degree within the required duration, may be excluded from the Faculty.

SD22 Oral Examinations

The examiners may require candidates to present themselves for *viva voce* questioning in addition to such written and practical examinations as may be prescribed by the Senate.

SD23 Supplementary Examination

Any candidate who fails a module with a mark of not less than 40% shall be permitted to write a supplementary examination in the module provided that the module assessment includes a formal written examination.

SD24 Award of Degree

The degree of Bachelor of Science Honours shall be awarded if the candidate has obtained at least 50% for each and every module that make up the curriculum for that subject.

SD25 Cum Laude

The degree of Bachelor of Science Honours shall be awarded *cum laude* to a candidate who:
(i) obtains a weighted average mark of at least 75 percent over all coursework modules required for the degree; and
(ii) obtains a mark of at least 75 percent for the Honours project.
Weights shall be assigned to modules in proportion to their credit values.

MASTER OF SCIENCE (COURSEWORK)

SDC1 Eligibility

The following shall be eligible to register as a candidate for the degree of Master of Science by coursework:
(i) An applicant who holds a Bachelor of Science Honours degree of the University or has been admitted to the status thereof.
(ii) An applicant who holds a Bachelor of Science degree of the University or has been admitted to the status thereof, and who prior to registration as a candidate for the Masters degree has had at least three years of relevant experience.
(iii) An applicant in terms of Common Rule GR7, who prior to registration as a candidate for the degree has had at least three years of relevant experience.

Candidates in categories (ii) and (iii) may be required by Senate to comply with further conditions to qualify for the award of the degree.

SDC2 Proposed Subject of Study

Before registration for the dissertation, all intending candidates for the degree shall submit for the approval of the Senate a statement of the subject of special study

which they propose to pursue. The Senate may, at its discretion, decline to approve such subject if
(i) in its opinion, it is unsuitable in itself; or
(ii) it cannot profitably be studied or pursued under the supervision of the University; or
(iii) the conditions under which the candidates propose to work are unsatisfactory; or
(iv) it is considered to be unethical to pursue such research.

SDC3 Programme of Study

(i) A candidate for the degree shall be required to pursue an approved module of research or special study comprising 50% of the total credits for the degree under the guidance of a supervisor appointed by the Senate.
(ii) A candidate shall also complete such other modules as prescribed for the degree and comply with such other conditions as may be prescribed by the Senate.

SDC4 Duration of Study

(i) Full time students shall be required to present themselves for the final examination of all the coursework modules in two successive semesters and part-time students shall be required to present themselves for all parts of the examination over four successive semesters, except as provided for in rule SDC9(ii) below.
(ii) Candidates who, at the end of any semester, are not able to propose a future curriculum acceptable to the Senate which will allow them to complete their degree within the required duration, may be excluded from the Faculty.
(iii) Candidates who after six semesters have not completed all the requirements for the degree may be refused permission to renew their registration.

SDC5 Examination

The examination shall encompass coursework modules as prescribed by the Senate and a research report showing both knowledge of methods of research and facility in their application.

SDC6 Oral Examination

The examiners may require candidates to present themselves for *viva voce* questioning, in addition to such other examination as may be prescribed by the Senate.

SDC7 Declaration

Every dissertation submitted shall be accompanied by a declaration to the satisfaction of the Senate stating that it has not been submitted for a degree in this or any other university, and that it is the candidate's own original work.

SDC8 Award of Degree

Candidates shall be required to pass each coursework module with a mark of at least 50% and the dissertation shall be required to be of a standard worthy of a pass.

SDC9 Supplementary Examination

(i) No Supplementary examinations will be awarded for any coursework modules.
(ii) Candidates who have failed one module with a credit value of at most 16 may be permitted to repeat such module in the next semester in which it is offered and cannot attempt the module more than once.
(iii) Applications to re-submit a dissertation which has been rejected will not be entertained, but the Senate may, on the advice of the examiners, invite a candidate to re-submit a dissertation in a revised or extended form.

SDC10 Cum Laude

The degree of Master of Science by coursework shall be awarded *cum laude* where a candidate has
(i) produced a dissertation which, in the view of the examiners, is worthy of distinction; and
(ii) obtained an average mark of at least 75% in the coursework component of the degree.

SDC11 Further Compliance

Candidates shall further comply with all the provisions of Rules CR1 to CR22.

MASTER OF SCIENCE

SD26 Eligibility

The following shall be eligible to register as a candidate for the degree of Master of Science:
(i) An applicant who holds a Bachelor of Science Honours degree of the University or has been admitted to the status thereof.
(ii) An applicant who holds a Bachelor of Science degree of the University or has been admitted to the status thereof, and who prior to registration as a candidate for the Masters degree has had at least three years of relevant experience.
(iii) An applicant in terms of Common Rule GR7, who prior to registration as a candidate for the degree has had at least three years of relevant experience.
Candidates in categories (b) and (c) may be required by Senate to comply with further conditions to qualify for the award of the degree.

SD27 Proposed Subject of Study

Before registration, all intending candidates for the degree shall submit for the approval of the Senate a statement of the subject of study which they propose to

pursue. The Senate may, at its discretion, decline to approve such subject if
(i) in its opinion, it is unsuitable in itself; or
(ii) it cannot profitably be studied or pursued under the supervision of the University; or
(iii) the conditions under which the candidates propose to work are unsatisfactory; or
(iv) it is considered to be unethical to pursue such research.

SD28 Programme of Study

(i) A candidate for the degree of Master by research shall be required to pursue an approved programme of research or special study on some subject falling within the scope of the studies represented in the University.
(ii) A candidate shall also comply with such other conditions as may be prescribed by the Senate and the rules of the faculty concerned.

SD29 Duration of Degree

(i) No candidate who has been registered for the degree for less than two semesters shall be eligible for the award of the degree.
(ii) Candidates who after six semesters have not completed the requirements for the degree may be refused permission to renew their registration.

SD30 Examination

(i) Candidates for the degree shall be required to submit a dissertation embodying the results of their research.
(ii) At least three months before the dissertation is to be presented, a candidate shall give notice in writing to the Dean of the Faculty. A candidate shall submit at the same time the proposed title and an outline of the plan and general scope of the work. In the event of a candidate failing to submit the dissertation within six months the notice of intention to submit will lapse and a further notice of intention shall be submitted.

SD31 Oral Examinations

The examiners may require candidates to present themselves for *viva voce* questioning, in addition to such other examination as may be prescribed by the Senate.

SD32 Dissertation Declaration

Every dissertation submitted shall be accompanied by a declaration to the satisfaction of the Senate stating that it has not been submitted for a degree in this or any other university, and that it is the candidate's own original work.

SD33 Single Submission

Applications to re-submit a dissertation which has been rejected will not be entertained, but the Senate may, on the advice of the examiners, invite a candidate to re-submit a dissertation in a revised or extended form.

SD34 Cum Laude

The degree of Master of Science may be awarded *cum laude* if the dissertation is deemed by the examiners to be worthy of distinction.

SD35 Further Compliance

Candidates shall further comply with all the provisions of Rules MR1 to MR17.

DOCTOR OF PHILOSOPHY

SD37 Eligibility

The following shall be eligible for admission as a candidate for the degree of Doctor of Philosophy in the Faculty of Science:
(i) Any Master of Science of the University of not less than two years' standing.
(ii) Any Bachelor of Science Honours of the University of not less than three years' standing who has attended as a registered student of the University for at least three years and whom the Senate has specially exempted from the Master's examination.
(iii) A graduate of another recognised university who has been admitted to the status of Master of Science and who has attended as a registered student of the University for at least two years after obtaining the qualifications by virtue of which such permission has been granted.
(iv) A graduate of another recognised university who has been admitted to the status of Bachelor of Science Honours who has attended as a registered student of the University for at least three years and whom the Senate has specially exempted from the Master's examination.
(v) A candidate who has been admitted to the degree in terms of Common Rule GR7, who has attended as a registered student of the University for at least three years after being admitted as a student, and who has been exempted from the Master's examination.

SD38 Programme of Study

Candidates shall be required to pursue research on some subject connected with the mathematical, physical, natural or applied sciences, under the guidance of a supervisor appointed by the Senate.

SD39 Further Compliance

Candidates shall further comply with all the provisions of Rules DR1 to DR17.

DOCTOR OF SCIENCE

Candidates for this degree should consult the Faculty Office for further information

MASTER OF ENVIRONMENTAL MANAGEMENT

SDEM1 Eligibility

The following shall be eligible to register as a candidate for the degree of Master of Environmental Management:

(i) An applicant who holds a Bachelor of Science Honours degree of the University in any of the Natural, Environmental or Geographical Sciences, or has been admitted to the status of such a degree.

(ii) An applicant who holds an Honours degree of the University which is deemed to have a suitable environmental content and emphasis, or who has been admitted to the status of such a degree.

(iii) An applicant who holds a Bachelor of Science degree of the University in any of the Natural, Environmental or Geographical Sciences, or has been admitted to the status of such a degree, and has had at least three years of relevant experience prior to registration for the Masters degree.

(iv) An applicant who holds a Bachelors degree of the University which is deemed to have a suitable environmental content and emphasis, or who has been admitted to the status of such a degree; provided that the candidate shall have had at least three years of relevant experience prior to registration for the Masters degree.

(v) An applicant in terms of Common Rule GR7, who, prior to registration for the Masters degree, has had at least three years of relevant experience.

Candidates in categories (iii) (iv) and (v) may be required by Senate to comply with further conditions to qualify for the award of the degree.

SDEM2 Programme of Study

(i) A candidate for the degree shall be required to pursue an approved module of research or special study comprising between 25 and 50% of the total credits for the degree under the guidance of a supervisor appointed by the Senate.

(ii) A candidate shall also complete such other modules as prescribed for the degree and comply with such other conditions as may be prescribed by the Senate.

SDEM3 Further Compliance

Candidates shall further comply with all the provisions of Rules SDC1 to SDC10, and CR1 to CR22.

MASTER IN MARINE & COASTAL MANAGEMENT

SDMCM1 Eligibility

The following shall be eligible to register as a candidate for the degree of Master of Marine & Coastal Management

(i) An applicant who holds a Bachelor of Science Honours degree of the University in any of the Natural, Environmental or Geographical Sciences, or has been admitted to the status of such a degree.

(ii) An applicant who holds an Honours degree of the University which is deemed to have a suitable environmental content and emphasis, or who has been admitted to the status of such a degree.

(iii) An applicant who holds a Bachelor of Science degree of the University in any of the Natural, Environmental or Geographical Sciences, or has been admitted to the status of such a degree, and has had at least three years of relevant experience prior to registration for the Masters degree.

(iv) An applicant who holds a Bachelors degree of the University which is deemed to have a suitable environmental content and emphasis, or who has been admitted to the status of such a degree; provided that the candidate shall have had at least three years of relevant experience prior to registration for the Masters degree.

(v) An applicant in terms of Common Rule GR7, who, prior to registration for the Masters degree, has had at least three years of relevant experience.

Candidates in categories (c) (d) and (e) may be required by Senate to comply with further conditions to qualify for the award of the degree.

SDMCM2 Further Compliance

Candidates shall further comply with all the provisions of Rules SDC1 to SDC10 and CR1 to CR22 inclusive

PROGRAMME AND DEGREE CURRICULA

This section of the Handbook contains detailed information on the structure of majors within a BSc degree, the curricula for the programmes offered by Schools within the Faculty, and the requirements for the BScHons degree in the various disciplines. For details of the modules which comprise the majors and programmes consult the Schools section under the appropriate school headings.

BSc DEGREE

First Year Curricula

Students registering for a general BSc degree must select modules from a core curriculum in their first year. These curricula have been designed to cover the range

of subjects in the general area of study and include any prerequisite or corequisite modules. The second semester modules shown are the recommended modules; students should register for these modules at the beginning of the year but may change their registration at mid-year in light of their experiences with and performance in the first semester modules.

BSc stream M

Students in this stream are intending to have at least one major in Mathematics, Applied Mathematics, Statistics, Computer Science, Physics or Chemistry. The curriculum for students majoring in Mathematics, Applied Mathematics, Statistics, Computer Science or Physics is given in table BSC-M; the curriculum for students majoring in Chemistry is given in table BSC-CH.

Table BSC-M		**BSc M-Stream**	
- first year curriculum			
Year 1 Semester 1		**Semester 2 (recommended)**	
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Comp 1S1 Computer Science 1A *or* Comp 1X1 Computer Science 1X **Two modules from** Stat 1S1 Statistics 1A *or* Math 1M1 Mechanics 1 *or* Phys 1S1 Physics 1S1 *or* Economics 1A	16C 32C	**Three modules from** Comp 1S2 Computer Science 1B *or* Stat 1S2 Statistics 1B *or* Math 1O2 Ops Research 1 *or* Acsc 1A2 Actuarial Sci 1A *or* Phys 1S2 Physics 1S2 *or* Economics 1B	48C

Note:
For students in this stream intending to major in Psychology, Psychology 1A/B can replace Economics 1A/B in this curriculum

BSc stream G

Students in this stream are intending to have at least one major in Biological Sciences, Geological Sciences, Environmental Sciences, Geography or Chemistry. Student majoring in Biological Sciences should follow the core curriculum for their second major, or if there is not one they should follow the level-1 curriculum for the programme in Biological Sciences. The curriculum for students majoring in Geological Sciences, Environmental Sciences or Geography is given in table BSC-G; the curriculum for students majoring in Chemistry is given in table BSC-CH.

Table BSC-G		**BSc G-stream**	
- first year curriculum			
Year 1 Semester 1		**Semester 2 (recommended)**	
Chem 1F1 Fundamental Chem 1	16C	Envs 1G2 Environmental Geography	16C
Geol 1G1 Fundamentals of	16C	Geol 1H2 Brief History of the Earth	16C

Geology and Geol 1R1 Rocks & Minerals *or* Psychology 1A		and Geol 1L2 Understanding Landscapes *or* Biol 1C2 Processes & Structures of Life	
Biol 1A1 Diversity of Life	16C		
Math 1G1 General Maths 1G1 *or* Phys 1G1 General Physics 1G1 *or* Geog 1U1 Urban Environments	16C	**Two modules from** Math 1G2 General Maths 1G2 *or* Phys 1G2 General Physics 1G2 *or* Chem 1F2 Fundamental Chem2 *or* Chem 1G2 General Chemistry *or* Biol 1C2 Process & Structures *or* Biol 1D2 Molecules to Organisms *or* other module (16C)	32C

BSc stream M or stream G, Chemistry major

Students majoring in Chemistry should follow the curriculum in table BSC-CH, and select the appropriate Mathematics module for their stream (M-stream may take Maths 1S1/1S2 whereas G-stream must take Maths 1G1/1G2)

Table BSC-CH		**BSc M-stream or G-stream (Chemistry)**	
- first year curriculum			
Year 1 Semester 1		**Semester 2 (recommended)**	
Chem 1F1 Fundamental Chem 1	16C	Chem 1F2 Fundamental Chem 2	16C
Math 1S1 Mathematics 1S1 *or* Math 1G1 General Maths 1G1	16C	Math 1S2 Mathematics 1S2 *or* Math 1G2 General Maths 1G2	16C
Phys 1S1 Physics 1S1	16C		
Biol 1A1 Diversity of Life *or* Comp 1S1/1X1 Computer Science *or* Psychology 1A	16C	**Two modules from** Phys 1S2 Physics 1S2 *or* Biol 1C2 Processes & Structures *or* Biol 1D2 Molecules to Organisms *or* other module (16C)	32C

Rules of Combination for majors in BSc degree

Actuarial Science

Level 1: Stat 1S1, Stat 1S2, Math 1S1, Math 1S2, Acsc 1A2
Level 2: Stat 2A1, Acsc 2F1, Math 2C1, Math 2A1, Stat 2B2, Acsc 2A2
Level 3: Acsc 3S1 and Acsc 3A2

Cellular Biology

The modules comprising this major subject are concerned with the study of cellular physiology and the biochemistry of micro-organisms, animals and plants. Molecular biology and genetics, seed biology and plant biotechnology are also emphasised.
Level I: Biol 1A1, Biol 1C2, Biol 1D2, Chem 1F1, Chem 1F2 or Chem 1G2

Level 2: Biol 2M2, Biol 2C1 and Biol 2T1 and further modules with a credit value of at least 8 credits from list Bio-A
Level 3: Biol 3R1 or Biol 3R2 and further modules with a total credit value of at least 48 credits from list Bio-B

List Bio-A

Biol 2G1	Classical Genetics
Biol 2L1	Evolution and Life
Biol 2I2	Basic Immunology
Biol 2S2	Protein Structure and Function
Biol 2P1	Parasites & People

List Bio-B

Biol 3F1	Functional Cell Architecture
Biol 3T2	Principles of Biotechnology
Biol 3Y2	Systematics and Evolution
Biol 3S1	Seeds and Plant Propagation
Biol 3I2	Comparative Immunology
Biol 3N2	Environmental Microbiology

In addition, it will be necessary to pass the specified prerequisite and corequisite modules.

Environmental Biology
This comprises the study of animal and plant biology, physiology, ecology, evolution and applied ecology in relation to resource management.
Level 1: Biol 1A1, Biol 1C2, Biol 1D2, Chem 1F1, Chem 1F2 or Chem 1G2
Level 2: Biol 2L1 and Biol 2T1 and further modules with a total credit value of at least 32 credits from List Bio-C:
Level 3: Biol 3R1 or Biol 3R2 and a further module or modules with a total credit value of at least 48 from List Biol-D:

List Bio-C

Biol 2G1	Classical Genetics
Biol 2A1	Animal Ecophysiology
Biol 2E2	Plants and Environment
Biol 2F2	Applied Field Techniques
Biol 2D2	Biodiversity across Habitats
Biol 2P1	Parasites & People

List Bio-D

Biol 3E1	Community Ecology
Biol 3P2	Applied Plant Physiology
Biol 3M2	Marine Animal Ecophysiology
Biol 3H2	Behavioural Ecology 1
Biol 3Q2	Aquatic Ecosystems
Biol 3U1	Intro to Pollution Biology
Biol 3B2	Behavioural Ecology 2
Biol 3V1	Parasitism, Public Health and Evolution
Biol 3Y2	Systematics and Evolution

In addition, it will be necessary to pass the specified prerequisite and co-requisite modules.

Biological Sciences

This choice of major subject allows the student to follow a more flexible curriculum in Biological Sciences with certain modules being core (specified) but with a greater number of electives.

Level 1: Biol 1A1, Biol 1C2, Biol 1D2, Chem 1F1, Chem 1F2 or Chem 1G2

Level 2: Biol 2G1, Biol 2L1, Biol 2T1 and further modules with a total credit value of at least 24 credits from list Bio-E:

Level 3: Biol 3R1 or Biol 3R2 and further modules with a total credit value of at least 48 chosen from those listed in Bio-B and Bio-D.

List Bio-E

Biol 2A1	Animal Ecophysiology
Biol 2E2	Plants and Environment
Biol 2D2	Biodiversity across Habitats
Biol 2F2	Applied Field Techniques
Biol 2P1	Parasites & People
Biol 2I2	Basic Immunology
Biol 2S2	Protein Structure & Function

In addition, it will be necessary to pass the necessary prerequisite and co-requisite modules.

Chemistry

Level 1: Chem 1F1, Chem 1F2, Maths 1G1 or Maths 1S1, Maths 1G2 or Maths 1S2, Phys 1S1, Phys 1S2

Level 2: Chem 2A1, Chem 2L1, Chem 2P1, Chem 2I2, Chem 2O2, Chem 2S2
Level 3: Chem 3I1, Chem 3O1, Chem 3L2, Chem 2P2

Applied Chemistry
Level 2: Chem 2D1, Chem 2E1, Chem 2C2, Chem 2W2
Level 3: Chem 3C1, Chem 3T1, Chem 3R2, Chem 3X2, Chem 3Y2

Computer Science
Level 1: Comp 1S1 or Comp 1X1, Comp 1S2, Maths 1S1, Maths 1S2
Level 2: Comp 2O1, Comp 2D2
Level 3: Comp 3L1, Comp 3P2, and 2 further modules selected from Comp 3A1, Comp 3C1, Comp 3N1, Comp 3D2, Comp 3O2, Comp 3X2

Economics
In terms of Rule SD6(iv) Economics can only be taken as a major if accompanied by a major subject from List A
Level 1: Econ 1A, Econ 1B
Level 2: Econ 2A, Econ 2B
Level 3: Econ 3SA plus 3 further level-3 modules in Economics.
Students are advised to combine their electives along the following broad lines of specialisation, since these conform to the major sectors in which graduate economists are likely to find employment.
Banking & Finance
International Economics
Industrial Organisation
Public Finance
Economic Modelling
Trade & Industry
International Economics
Industrial Organisation
Maritime Transport Economics
Environmental Economics
Labour Economics
Public Sector & Policy
Industrial Organisation
Public Finance
Labour Economics
Economic Modelling
Economics of Africa
Environmental Economics

Environmental Science
The curriculum for a major in Environmental Science must include the modules
Level 1: Geog 1U1, Envs 1G2
Level 2: 48 credits from Envs 2M1, Envs 2S1, Geol 2C1, Geol 2W2, Geol 2O1, Envs 2A2, Envs 2W2, Envm 2E1, Chem 2E1
Level 3: Envs 3P2, Geog 2S1, Envs 3G1, and a further 16 credits from Biol 3E1, Biol 3Y2, Envs 3C2, Envs 3B1, Geol 3N1, (Econ 3EE or LawD 4E2), Biol 3U1
In addition, it will be necessary to gain credit for the specified prerequisite and co-requisite modules

Geography
The curriculum for a major in Geography (see Rule SD6(iv)) must include:
Level 1: Geog 1U1, Envs 1G2
Level 2: Envs 2M1, Envs 2S1, Geog 2L2, Geog 2D2
Level 3: Geog 3P2 and a further 48 credits from Envs 3A1, Envs 3G1, Envs 3C2, Geog 3S1, Envs 3B1, Geog 3L2, Geog 3T1
In addition, it will be necessary to gain credit in the specified prerequisite and co-requisite modules.

Environmental Management
The curriculum for a major in Environmental Management (see Rule SD6(iv)) must include
Level 1: Geog 1U1, Envs 1G2
Level 2: Envs 2M1, Envs 2S1, Geog 2D2 and 16 further credits from Envs 2A2, Envs 2W2, Geol 2C1, Geol 2W2, Geol 2O1, Envm 2E1
Level 3: Envm 3P2, Geog 3S1, (LawD 4E2 or Econ 3EE) and a further 16 credits from Envs 3G1, Envs 3A1, Envs 3C2, Envs 3B1, Geog 3T1, Geog 3L2
In addition, it will be necessary to gain credit in the specified prerequisite and co-requisite modules

Geology
Level 1: Geol 1G1, Geol 1R1, Geol 1E2, Geol 1L2, Chem 1F1, Colt 1L1 or Colt 1L2
Level 2: Geol 2M1, Geol 2P2, Geol 2F8 and one of Geol 2H1, Geol 2T1, Geol 2E2, Geol 2L2
Level 3: Geol 3O2, Geol 3V2, Geol 3F8 and 24 further credits from level-3 modules in Geology

Environmental and Engineering Geology
Level 1: Geol 1G1, Geol 1R1, Geol 1E2, Geol 1L2, Chem 1F1, Colt 1L1 or Colt 1L2
Level 2: Geol 2M1, Geol 2P2, Envs 3G1
Level 3: Geol 3E1, Geol 3N1, Geol 3E2, Geol 3R2 and 16 further credits from level-

3 modules in Geology

Mathematics
Level 1: Math 1S1, Math 1S2
Level 2: Math 2A1, Math 2C1, Math 2C2
Level 3: Math 3M1, Math 3Y1, Math 3A2 and one of Math 3L1, Math 3G2, Math 3N2, Math 3O2, Math 3T2, Math 3Q2

Applied Mathematics
Level 1: Math 1S1, Math 1S2
Level 2: Math 2A1, Math 2C1, Math 2C2
Level 3: Math 3M1, Math 3P1 and two of Math 3L1, Math 3A2, Math 3G2, Math 3Q2, Math 3N2, Math 3O2, Math 3T2

Physics
Level 1: Phys 1S1, Phys 1S2, Maths 1S1, Maths 1S2
Level 2: Phys 2S1, Phys 2S2, (Math 2A1, Math 2C1, Math 2C2) or Phys 2M1
Level 3: Phys 3E1, Phys 3Q1, Phys 3S2, Phys 3T2

Psychology
Level 1: Psyc 101, Psyc 102
Level 2: Psyc 203, Psyc 204
Level 3: Psyc 305, Psyc 306
Note:
Only these Psychology modules will be accepted for credit in terms of Rule SD6

Statistics
Level I: Stat 1S1, Stat 1S2, Math 1S1 and Math 1S2
Level II: Stat 2A1, Stat 2B2, Math 2C1 and Math 2A1
Level III: Stat 3P1, Stat 3L1, Stat 3R2 and Stat 3A2

Focused Programmes

PROGRAMME IN ACTUARIAL SCIENCE

The purpose of this Programme is to prepare students for a career as an actuary or in related fields, by offering modules recommended by the British Institute of Actuaries. Graduates will be expected to have the necessary knowledge and understanding of the sophisticated mathematical and statistical theory underlying actuarial science and the skill to apply this theory in a variety of situations. They will be employable in the fields of financial analysis or (after further study) as actuaries.

Apart from their technical expertise, graduates from the Programme will be expected

to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Entry Requirements

To qualify for entry to this programme at level-I, a candidate must obtain an A in higher grade Mathematics in the matriculation examination. Subject to the discretion of the Dean, a higher grade pass in Computer Studies may replace the Physical Science/Biology requirement of Rule SD2.

Notes:

(1) Students who do not qualify to enter the programme at level-I but who pass the level-I modules in Mathematics and Actuarial Science at an acceptably high level at the first attempt may be accepted into the programme in level-II.

(2) To qualify as an actuary with the Institute of Actuaries in the United Kingdom one is required to pass 14 subjects covering a wide range of material including Economics, Accounting, Statistics and Finance.

(3) In order to promote actuarial science the Institute implemented an exemption procedure in terms of which a student who performs sufficiently well in an appropriate set of university-based modules may apply for exemptions from certain Institute subjects.

(4) Precise equivalences are continually under review by the Institute, but it is expected that exemption from Subject 101 will be considered for those obtaining good results in Mathematics I (Math 1S1 and 1S2), Statistics I (Stat 1S1 and 1S2) and Statistics II (Stat 2A1 and 2B2); and exemptions will be considered from Subject 107 for Economics I (Economics 1A and 1B), from Subject 102 for Financial Mathematics (Acsc 2F1), from Subject 103 for Stochastic Modelling (Acsc 3S1), from Subject 108 for Financial Reporting (1A and 1B) and from Subject 109 for Financial Economics (Acsc 3A2).

(5) It must be stressed that Actuarial Science is also available as a major subject in a BSc degree, where it may be combined with subjects other than Statistics. The actuarial science modules at levels I, II and III are available to all students who have the necessary prerequisites. Curricula which include actuarial science modules at level III are valuable not only to those who wish to become actuaries, but also to anyone interested in pursuing a career in financial mathematics or portfolio management.

(6) The attention of prospective students is drawn to the fact that, to register for the Actuarial Science 1A and then for the Actuarial Science II module Financial Mathematics (Acsc 2F1), the prerequisite level I modules in Mathematics and Statistics must have been passed at an acceptably high level at the first attempt.

(7) Information on the modules will be found in the section of the Handbook devoted to the School of Mathematical and Statistical Sciences.

Curriculum

Table AC		**Programme in Actuarial Science**	
Year 1 Semester 1		***Semester 2***	
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Econ 1A Economics 1A	16C	Econ 1B Economics 1B	16C
Financial Reporting 1A (note 1)	16C	Financial Reporting 1B (note 1)	16C
Stat 1S1 Statistics 1A	16C	Stat 1S2 Statistics 1	16C
		Acsc 1A2 Actuarial Science 1	16C
Year 2 Semester 1		***Semester 2***	
Stat 2A1 Statistics 2A	16C	Stat 2B2 Statistics 2B	32C
Acsc 2F1 Financial Mathematics	32C	Acsc 2A2 Actuarial Mathematics	16C
Math 2A1 Linear Algebra	16C		
Math 2C1 Advanced Calculus	16C		
Year 3 Semester 1		***Semester 2***	
Stat 3P1 Probability Theory	16C	Stat 3R2 Random Processes	16C
Stat 3L1 Linear Models	16C	Stat 3A2 Applied Statistics	16C
Acsc 3S1 Stochastic Modelling	32C	Acsc 3V2 Survival Models	32C

Note:
(1) For students transferring into the Actuarial Science programme after year 1, Financial Reporting 1A and 1B are not required although strongly recommended
(2) Economics 1B or Financial Reporting 1B may be taken in year 2 or 3 if the timetable permits.

PROGRAMME IN BIOLOGICAL SCIENCES

The purpose of the Programme is to produce graduates who have a sound knowledge of, and training in, various theoretical and practical aspects of Biology, with the potential for some degree of specialisation in the cellular or environmental facets of the subject.

Apart from their scientific technical expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Curriculum

Table BIO-I		**Programme in Biological Sciences**	
Year 1 Semester 1		***Semester 2***	
Biol 1A1 Diversity of Life	16C	Biol 1C2 Processes and Structures of Life	16C
Chem 1F1 Fundamental Chemistry 1	16C	Biol 1D2 From Molecules to Organisms	16C
		Chem 1F2 Fundamental Chemistry 2 or Chem 1G2 General Chem	16C
Elective modules (unrestricted – but subject to Rule SD6)			48C
Year 2 Semester 1		***Semester 2***	
Biol 2G1 Classical Genetics	8C		
Biol 2T1 Biological Sciences Toolkit	8C		
Biol 2L1 Evolution & Life	8C		
Elective modules from List BIO-2a			32C
Elective modules from List BIO-2b			32C
Elective modules from List BIO-2a or BIO-2b			8C
Elective modules (unrestricted – but see Rule SD6; these may be from lists BIO-2a and BIO-2b)			32C
Year 3			
Biol 3R1/2 Research Project			16C
Elective modules from List BIO-3			112C

Note: Modules at levels II and III in tables BIO-2a, BIO-2b and BIO-3 will not necessarily always be offered in the semesters indicated in the tables.

List BIO-2a	(level II elective modules)
Biol 2C1	Biochemistry 16C
Biol 2H2	Microbiology & Health 8C
Biol 2I2	Basic Immunology 8C
Biol 2M2	Molecular Biology 16C
Biol 2S2	Protein Structure and Function 8C
List BIO-2b	
Biol 2A1	Animal Ecophysiology 16C
Biol 2E2	Plants and Environment 8C
Biol 2F2	Applied Field Techniques 8C
Biol 2P1	Parasites & People 8C
Biol 2D2	Biodiversity across habitats 8C

List BIO-3	(level III elective modules)
*Biol 3C2	Plant Biochemistry 8C
Biol 3F1	Functional Cell Architecture 16C
*Biol 3G2	Plant Growth & Development 8C
Biol 3I2	Comparative Immunology 8C
*Biol 3O1	Co-ordination of Metabolism 8C
Biol 3S1	Seeds & Plant Propagation 16C
Biol 3T2	Principles of Biotechnology 8C
Biol 3Y2	Systematics and Evolution 16C
Biol 3H2	Behavioural Ecology 1 8C
Biol 3B2	Behavioural Ecology 2 8C
Biol 3E1	Community Ecology 16C
Biol 3M2	Marine Animal Ecophysiology 8C
Biol 3P2	Applied Plant Physiology 16C
Biol 3Q2	Aquatic Ecosystems 8C
Biol 3U1	Intro to Pollution Biology 8C
Biol 3V1	Parasitism Public Health and Evolution 8C
Biol 3N2	Environmental Microbiology 16C
Envs 3G1	GIS Geog Info. Systems 16C
Envs 3B1	Biogeography 16C
#Meds 3V1	Virology 16C

* Biol 3C2, Biol 3G2, Biol 3O1 may not be offered in 2004.

#Note that Meds 3V1 will have limited availability depending on spaces.

PROGRAMME IN BIO-MEDICAL SCIENCES

This programme leads to the exit qualification BSc in Bio-Medical Sciences. It is offered within the Faculty of Science, but both this faculty and the Faculty of Health Sciences contribute modules to its curriculum.

The purpose of the interdisciplinary programme is to produce graduates who have a sound knowledge of Biological Science with particular reference to its application to the medical and health-related fields. Students will have the opportunity to study fundamental biology and its application to various medical science fields. Graduates from the programme may proceed, among other possibilities, to careers in research and development in the medical and health sciences. The qualification is *not* an alternative route into M.B.Ch.B. studies.
Apart from their scientific and technical expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Entry Requirements
To qualify for entry to this programme at level-I, a candidate must obtain 42 matric points with a D in higher grade Mathematics and a higher grade C in Science and Biology
Notes:
(1) The Programme consists of a single stream. Information on its component modules will be found in the Life & Environmental Sciences part and in the Bio-Medicine part of the Handbook. It should be noted that all level I and most level II modules are prescribed.
(2) The first-year curriculum for this programme is such that transfer to BSc studies or to the BSc in Biological Sciences Programme is possible at the end of the first semester. This is important in view of note 3 below.
(3) Places in levels II and III in the Programme will be restricted. A preliminary selection of students to be allowed into level II of the Programme will be made at the end of the 1st semester but a final decision on whether a student may continue will only be taken once he or she has completed the first-year curriculum. Selection will be on academic merit
(4) Since no more than 30 students will enter level III in any year, some of the elective modules may not be adequately subscribed. Such under-subscribed modules may be withdrawn at the discretion of the departments concerned.
(5) All students entering level II are required to be vaccinated against Hepatitis B. Students may have to bear the cost.

Curriculum

Table BMED		Programme in Bio-Medical Sciences	
Year 1 Semester 1		***Semester 2***	
Biol 1A1 Diversity of Life	16C	Biol 1C2 Processes & Structures of Life	16C
Math 1G1 General Mathematics	16C	Biol 1D2 From Molecules to Organisms	16C
Chem 1F1 Fundamental Chemistry 1	16C	Chem 1F2 Fundamental Chemistry 2 or Chem 1G2 General Chem	16C
Phys 1G1 General Physics	16C	MedS 1H2 Human Body: Form & Function	16C
Year 2 Semester 1		***Semester 2***	
Biol 2C1 Biochemistry	16C	Biol 2M2 Molecular Biology	16C
MedS 2N1 Neurophysiology	16C	Biol 2S2 Protein Structure & Function	8C
MedS 2C1 Cardio-respiratory Physiology	16C	MedS 2G2 Gastrointestinal Tract & Blood	16C
		MedS 2E2 Endocrine & Renal Physiology	16C
Elective modules from List BMED-2			24C
Year 3			
MedS 3P1/2 Research Project	16C	Biol 3T2 Principles of Biotechnology	8C
Biol 3F1 Functional Cell Architecture	16C	LawD 3A2 Bio-ethics 3A2	8C
MedS 3B1 Medical Bio-statistics	8C		
Elective modules from List BMED-3			72C

List BMED-2

Biol 2P1	Parasites and People	8C
Biol 2G1	Classical Genetics	8C
Biol 2H2	Microbiology and Health	8C
Biol 2I2	Basic Immunology	8C

List BMED-3

Biol 3V1	Parasitism, Public Health and Evolution	8C
MedM 3M2	Medical Microbiology	16C
MedV 3V1	Virology	16C
MedS 3D1	Metabolic Disease	16C
MedS 3E2	Bioenergetics & Exercise	8C
MedS 3H2	Basic Histopathology	8C
MedS 3N2	Neuro-endocrinology	8C
MedS 3W2	Wound Healing	8C

MedS 3T1	Environmental Toxicology	8C
MedH3H1	Haematology	8C
Biol 3I1	Comparative Immunology	8C

PROGRAMME IN PURE AND APPLIED CHEMISTRY

The purpose of this Programme is to produce graduates with a sound knowledge of chemistry, both theoretical and in its applications. Such graduates are expected to play an important role as practitioners in the chemical and related industries, in research and development, in management and in teaching at the secondary and tertiary levels.

Apart from their scientific and technical expertise, graduates from the Programme will be expected to have an awareness of the social and environmental impact of their work, and to exercise responsibility in the practice of their profession.

Curriculum

Table CH		**Programme in Pure & Applied Chemistry**	
Year 1: Semester 1		***Semester 2***	
Chem 1F1 Fundamental Chemistry 1	16C	Chem 1F2 Fundamental Chemistry 2	16C
Phys 1S1 Physics 1S1	16C	Phys 1S2 Physics 1S2	16C
Math 1S1 Mathematics 1S1 or (Math 1G1 Gen Maths 1G1	16C	Math 1S2 Mathematics 1S2 or Math 1G2 Gen Maths 1G2	16C
Electives			32C
Year 2: Semester 1		***Semester 2***	
Chem 2A1 Inter. Analytical Chem	8C	Chem 2I2 Inter. Inorganic Chem	8C
Chem 2P1 Inter. Physical Chem	8C	Chem 2O2 Inter. Organic Chem	8C
Chem 2L1 Inter. Instrumental Analysis	8C	Chem 2S2 Structure & Mechanism	8C
Chem 2E1 Environmental Chem	16C	Chem 2W2 Wood & Sugar Industry	8C
Chem 2D1 Industrial Chem	8C	Chem 2C2 Construction Materials	16C
Electives (subject to the requirements of Rule SD6)			32C
Year 3: Semester 1		***Semester 2***	
Chem 3I1 Inorganic Chemistry	16C	Chem 3P2 Physical Chemistry	16C
Chem 3O1 Organic Chemistry	16C	Chem 3L2 Instrumental Analysis	16C
Chem 3C1 Chemical Process Technology	16C	Chem 3R2 Integrated Project	16C
Chem 3T1 Technical Management	16C	Chem 3Y2 Polymers	8C
		Chem 3X2 Catalysis	8C

Note:

(1) For the purposes of prerequisite and co-requisite requirements, the modules Chem 1B1 and Chem 1B2 (intended for students who are registered in the special 4-year augmented curriculum) are equivalent to the modules Chem 1F1

and Chem 1F2 respectively, and may replace them in the above table. Likewise, the modules Math 1B1 and 1B2 may replace Math 1S1 and 1S2 respectively and Phys 1B1 and Phys 1B2 may replace Phys 1S1 and Phys 1S2.

(2) For further information on the individual modules in the curriculum, consult the Schools section of this Handbook.

PROGRAMME IN ENVIRONMENTAL SCIENCES

This programme is offered in three streams, Environmental and Life Sciences, Environmental and Earth Sciences, and Environmental Science and Chemistry.

The purpose of the Programme is to produce graduates who have a good knowledge of and technical skills in various theoretical and practical aspects of Environmental Science, with possible specialisation in one of the areas represented by the three streams.

Apart from their scientific and technical expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession

Entry Requirements

Subject to the discretion of the Dean a higher grade pass in Geography may be acceptable in place of the Physical Science/Biology requirement of Rule SD2.

Curriculum

Note: (ENV-L applies to the Environmental and Life Sciences stream, ENV-E to the Environmental and Earth Sciences stream and ENV-C to the Environmental Science and Chemistry stream)

Table ENV-L		**Programme in Environmental Sciences**	
		Environmental and Life Sciences Stream	
Year 1 Semester 1		***Semester 2***	
Geog 1U1 Urban Environments	16C	Envs 1G2 Environmental Geography	16C
Chem 1F1 Fundamental Chemistry 1	16C	Chem 1F2 Fundamental Chemistry 2 or Chem 1G2 General Chem	16C
Biol 1A1 Diversity of Life	16C	Biol 1C2 Processes & Structures of Life	16C
Geol 1G1 Fundamentals of Geology	8C	Geol 1E2 Brief History of Earth	8C
Geol 1R1 Rocks and Minerals	8C	Geol 1L2 Understanding Landscapes	8C
Year 2 Semester 1		***Semester 2***	
Envs 2M1 Environmental	8C	Geog 2L2 SA Landscapes in Transition or Geog 2D2	16C

Management		Environ & Development in SA	
Envs 2S1 Environmental Assessment	8C	Envs 2A2 Environmental Auditing or Envs 2W2 Env Auditing & Welfare Econ	8C
Biol 2L1 Evolution and Life	8C	Biol 1D2 From Molecules to Organisms	16C
Biol 2T2 Biological Sciences Toolkit	8C		
Elective(s) from List EV2 (Note 2)	32C	Elective from List EV2 (Note 2)	24C
Year 3 Semester 1		***Semester 2***	
Envs 3G1 GIS Geog Info Systems	16C	Econ 3EE Environmental Economics or LawD 4E2 Environmental Law	16C
Geog 3S1 Sustainable Cities	16C	Envs 3P2 Research Project (Note 4)	16C
Elective(s) from List EV3 (Note 3)	32C	Electives from List EV3 (Note 3)	32C

Notes to Table ENV-L (above):

(1) Students in the Life Sciences Stream may do the module Biol 1D2 From Molecules to Organisms instead of Geol 1E2 and Geol 1L2, with the permission of the Programme Director

(2) Students are required to obtain a further 16C from Biology at level 2 (or 32C if the module Biol 1D2 From Molecules to Organisms was taken at level 1). They are encouraged to do Chem 2E1 Environmental Chemistry and must do either Geol 2O1 Soil Resources or Geol 2W2 Water Resources

(3) Students must obtain 16 additional credits from Geography electives and 48 credits from Biology electives in List EV3.

(4) A research project may be supervised by staff either in Biology or Geography.

Table ENV-E		**Programme in Environmental Sciences**	
		Environmental and Earth Sciences Stream	
Year 1 Semester 1		***Semester 2***	
Geog 1U1 Urban Environments	16C	Envs 1G2 Environmental Geography	16C
Chem 1F1 Fundamental Chemistry 1	16C	Chem 1F2 Fundamental Chemistry 2 or Chem 1G2 General Chemistry	16C
Geol 1G1 Fundamentals of Geology	8C	Geol 1E2 Brief History of Earth	8C
Geol 1R1 Rocks and Minerals	8C	Geol 1L2 Understanding Landscapes	8C
Biol 1A1 Diversity of Life	16C	Biol 1C2 Processes & Structures of Life	16C
Year 2 Semester 1		***Semester 2***	
Envs 2M1 Environmental Management	8C	Geog 2L2 SA Landscapes in Transition or	16C
Envs 2S1 Environmental Assessment	8C	Geog 2D2 Environ & Development in SA	

Geol 2C1 Coastal & Marine Geology	8C	Envs 2A2 Environmental Auditing or Envs 2W2 Env Auditing & Welfare Econ	8C
Geol 2M1 Mineralogy	16C	Geol 2P2 Petrology	16C
Geol 2O1 Soil Resources	8C	Geol 2W2 Water Resources	8C
Elective from List EV2 (Note 1)	16C	Elective from list EV2 (Note 1)	16C
Year 3 Semester 1		***Semester 2***	
Envs 3G1 GIS Geog Info Systems	16C	Econ 3EE Environmental Economics or Environmental Law	16C
Geog 3S1 Sustainable Cities	16C	Envs 3P2 Research Project (Note 3)	16C
Geol 3N1 Environmental Geology	16C	Electives from List EV3 (Note 2)	32C
Elective(s) from List EV3 (Note 2)	16C		

Notes to Table ENV-E (above):

(1) Students are required to obtain a further 16C from Geology at level 2 and must do either Geol 2O1 Soil Resources or Geol 2W2 Water Resources. They are also encouraged to do Chem 2E1 Environmental Chemistry.

(2) Students must obtain 16 additional credits from Geography and 32 additional credits from Geology electives in List EV3.

(3) A research project may be supervised by staff either in Geography or Geology.

Table ENV-C		**Programme in Environmental Sciences**	
		Environmental Science and Chemistry Stream	
Year 1 Semester 1		***Semester 2***	
Geog 1U1 Urban Environments	16C	Envs 1G2 Environmental Geography	16C
Chem 1F1 Fundamental Chemistry 1	16C	Chem 1F2 Fundamental Chemistry 2	16C
Geol 1G1 Fundamentals of Geology	8C	Biol 1C2 Processes & Structures of Life	16C
Geol 1R1 Rocks and Minerals	8C	Math 1S2 Mathematics 1S2 or Math 1G2 General Mathematics 1G2	16C
Math 1S1 Mathematics 1S1 or Math 1G1 General Mathematics 1G1	16C		
Year 2 Semester 1		***Semester 2***	
Envs 2M1 Environmental Management	8C	Geog 2L2 SA Landscapes in Transition or	16C
Envs 2S1 Environmental Assessment	8C	Geog 2D2 Environ & Development in SA	
Chem 2E1 Environmental Chem	16C	Envs 2A2 Environmental Auditing or Envs 2W2 Env Auditing & Welfare Econ	8C
Chem 2A1 Inter. Analytical Chem	8C	Phys 1G2 General Physics	16C
Chem 2L1 Inter Instrumental Analysis	8C	Chem 2I2 Inter. Inorganic Chem	8C
Chem 2P1 Inter. Physical Chem	8C	Chem 2O2 Inter. Organic Chem	8C
Geol 2O1 Soil Resources	8C	Chem 2S2 Structure & Mechanism	8C
Year 3 Semester 1		***Semester 2***	
Envs 3G1 GIS and/or Geog 3S1	16C	Econ 3EE Environmental Economics or	16C

Sustainable Cities		Environmental Law	
Chem 3I1 Inorganic Chemistry	16C	Envs 3P2 Research Project (Note 2)	16C
Chem 3O1 Organic Chemistry	16C	Chem 3L2 Instrumental Analysis	16C
Elective(s) from List EV3 (Note 1)	16C	Elective(s) from List EV3 (Note 1)	16C

Note to Table ENV-C (above):

(1) Students must obtain at least 16 additional credits from Geography electives in List EV3. Physical Chemistry (Chem 3P2) may be included as an elective, but it requires the Physics modules Phys 1S1, 1S2, which can be taken in year 2 with the permission of the Programme Director.

(2) A research project may be supervised by staff either in Geography or Chemistry

LIST EV2

Code	Level 2 Elective Modules	Credit	Sem	Subject	Prereq
Biol 2E1	Plants & Environment	8	1	Biology	Biol 1C2, Chem 1F1
Biol 2P1	Parasites and People	8	1	Biology	Biol 1A1 or 1C2
Biol 2F2	Applied Field Techniques	8	2	Biology	48C (L1 Biol/ES)
Biol 2A2	Animal Ecophysiology	16	2	Biology	Chem 1F1, 1F2/1G2
Biol 2D2	Biodiversity Across Habitats	8	2	Biology	48C (L1 Biol/ES)
Biol 2T2	Biological Sciences Toolkit	8	2	Biology	48C (L1 Biol/ES)
Chem 2D1	Industrial Chem	8	1	Chemistry	Chem 1F1, 1F2/1G2
Chem 2M1	Chem of the Mining Industry	8	1	Chemistry	Chem 1F1, 1F2/1G2
Chem 2E1	Environmental Chemistry	16	1	Chemistry	Chem 1F1, 1F2/1G2
Envm 2E1	Introductory Ecology	8	1	Geography	64C (L1)
Geol 2T1	Structural Geology	8	1	Geology	Geol 1G1, 1R1, 1E2, 1L2
Geol 2H1	Geochemistry	8	2	Geology	64C(L1) - 16C(Chem1)
Geol 2L2	Palaeontology	8	2	Geology	64C(L1) - Geol 1G1
Geol 2F8	Geology Field Module	8	2	Geology	Geol 2M1, 2T1

LIST EV3					
Code	**Level 3 Elective Modules**	**Credit**	**Sem**	**Subject**	**Prereq**
Biol 3P2	Applied Plant Physiology	16	2	Biology	Biol 2E1
Biol 3M2	Marine Animal Ecophysiology	8	2	Biology	Biol 2F2, 2A2
Biol 3Q2	Aquatic Ecosystems	8	2	Biology	Biol 2F2, 2A2
Biol 3U1	Intro to Pollution Biology	8	1	Biology	48C(L2 Biol/ES)
Biol 3B2	Behavioural Ecology 2	8	2	Biology	48C(L2 Biol/Psycho)
Biol 3V1	Parasitism, Public Health and Evolution	8	1	Biology	Biol 2P1
Biol 3E1	Community Ecology	16	1	Biology	48C (L2 Biol/ES)
Biol 3Y2	Systematics & Evolution	16	2	Biology	Biol 1D2 & 48 C (L2 Biol)
Chem 3P2	Physical Chemistry	16	2	Chemistry	Chem 2P1, 2L1, Phys 1S1, 1S2
Chem 3T2	Technical Management	16	2	Chemistry	Chem 1F1, 1F2/1G2, 96(L2)
Chem 3A2	Applied Analytical Chemistry	16	2	Chemistry	Chem 2A1, 2L1, 3L2(coreq.)
Envs 3A1	Atmospheric Science	8	1	Geography	Envs 1S1, 1P2, 64C(L2)
Geog 3T1	Tourism Studies	8	1	Geography	64C(L2)
Envs 3B1	Biogeography	8	1	Geography	64C(L2)
Geog 3L2	Land Issues & Rural Develop	8	2	Geography	64C(L2)
Envs 3C2	Soil Erosion & Conservation	8	2	Geography	64C(L2)
Geol 3S1	Advanced Sedimentology	8	1	Geology	Geol 2P2
Geol 3T1	Advanced Structural Geology	8	1	Geology	Geol 2T1
Geol 3N1	Environmental Geology	16	1	Geology	16C (L2 Geol)
Geol 3V2	Geological Evolution of SA	16	2	Geology	Geol 2P2
Geol 3F8	Advanced Field Module	16	2	Geology	Geol 2F8, 2P2

PROGRAMME IN GEOGRAPHY AND ENVIRONMENTAL MANAGEMENT

The purpose of the interdisciplinary programme is to produce graduates who have a sound knowledge of, and training in, the various theoretical and practical aspects of environmental management for use in the management of environmental problems.

Apart from their scientific and technical expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Entry Requirements

Subject to the discretion of the Dean a higher grade pass in Geography may be acceptable in place of the Physical Science/Biology requirement of Rule SD2.

Curriculum

Table EM		*Programme in Geography & Environmental Management*	
Year 1 Semester 1		***Semester 2***	
Geog 1U1 Urban Environments	16C	Envs 1G2 Environmental Geography	16C
Econ 1A Economics 1A	16C	Research Methods in the Social Sciences	16C
Elective(s) from List EM1	32C	Econ 1B Economics 1B	16C
		Elective(s) from List EM1	16C
Year 2 Semester 1		***Semester 2***	
Envs 2M1 Environmental Management	8C	Geog 2L2 SA Landscapes in Transition	16C
Envs 2S1 Environmental Assessment	8C	Geog 2D2 Environ & Development in SA	16C
Econ 2A Economics 2A	16C	Econ 2B Economics 2B	16C
Environmental Ethics	8C	Envs 2A2 Environmental Auditing or	8C
Env2E1 Introductory Ecology	8C	Envs 2W2 Env Auditing & Welfare Econ	
Electives from List EM2	16C	Geol 2W2 Water Resources	8C
Year 3 Semester 1		***Semester 2***	
Envs 3G1 GIS Geog Info Systems	16C	Econ 3EE Environmental Economics	16C
Geog 3S1 Sustainable Cities	16C	Environmental Law	16C
Envs 3B1 Biogeography	8C	Envm 3P2 Research Project	16C
Electives from List EM3	24C	Envs 3C2 Soil Erosion & Conservation	8C
		Geog 3T1 Tourism Studies or Geog 3L2 Land Issues & Rural Develop	8C

LIST EM1

Code	Level 1 Elective Modules	Credits	Sem	Subject	Prereq
Biol 1A1	Diversity of Life	16	1	Biology	Nil
Biol 1C2	Processes and Structures of Life	16	2	Biology	Nil
Chem 1F1	Fundamental Chemistry 1	16	1	Chemistry	Nil
Geol 1G1	Fundamentals of Geology	8	1	Geology	Nil
Geol 1R1	Rocks and Minerals	8	1	Geology	Geol 1G1 (coreq)

LIST EM2					
Code	**Level 2 Elective Modules**	**Credit**	**Sem**	**Subject**	**Prereq**
Biol 2E1	Plants & Environment	16	1	Biology	Biol 1C2, Chem 1S1
Biol 2P1	Parasites and People	8	1	Biology	Biol 1A1 or 1C2
Biol 2F2	Applied Field Techniques	16	2	Biology	Biol 1A1
Geol 2C1	Coastal & Marine Geology	8	1	Geology	64C(L1) - Geol 1G1
Geol 2O1	Soil Resources	8	1	Geology	64C(L1) - Geol 1G1
Geol 2L2	Palaeontology	8	2	Geology	64C(L1) - Geol 1G1

LIST EM3					
Code	**Level 3 Elective Modules**	**Credit**	**Sem**	**Subject**	**Prereq**
Biol 3U1	Intro to Pollution Biology	8	1/2	Biology	48C L2(Biol)/ 48C L2(ES)
Biol 3V1	Parasitism, Public Health and Evolution	8	1/2	Biology	Biol 2P1
Econ 3ME	Maritime Transport Economics	16	1	Economics	Econ 2A, 2B
Econ 3SA	Macroeconomic Policy in SA	16	1	Economics	Econ 2A, 2B
Econ 3EA	Economics of Africa	16	2	Economics	Econ 2A, 2B
Econ 3IT	International Economics	16	2	Economics	Econ 2A, 2B
Envs 3A1	Atmospheric Science	8	1	Geography	Envs 1S1, 1P2, 64C(L2)
Geog 3T1	Tourism Studies	8	1	Geography	64C(L2)
Geol 3N1	Environmental Geology	16	1	Geology	16C L2(Geol)
Geog 3L2	Land Issues and Rural Development	8C	2	Geography	64C(L2)

PROGRAMME IN GEOCOMPUTING

The purpose of this Programme is to produce graduates who are expert in both Geology and Computer Science, and in the application of sophisticated concepts and methods from the latter discipline to problems in the Earth Sciences.

Apart from their technical expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Curriculum

School of Geological and Computer Sciences Programme in Geocomputing			
Year 1 Semester 1		***Semester 2***	
Geol 1G1 Fundamentals of Geology	8C	Geol 1E2 Brief History of the Earth	8C
Geol 1R1 Rocks and Minerals	8C	Geol 1L2 Understanding Landscapes	8C
Comp 1S1 or 1X1 Computer Science 1S1 or 1X1	16C	Comp 1S2 Computer Science 1S2	16C
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Chem 1F1 Fundamental Chem 1	16C	Elective modules	16C

Year 2 Semester 1		*Semester 2*		
Comp 2O1 Object-Oriented Programming	16C	Comp 2D2 Data Structures		16C
Geol 2M1 Mineralogy	16C	Geol 2P2 Petrology		16C
Envs 3G1 Geog Info Systems	16C	Geol 2S2 Geostatistics		16C
Elective modules	16C	Elective modules		16C
Year 3				
Elective modules in Geology from List GC-A below, which must include Geol 3O2, Geol 3N1 and Geol 3M1.				64C
Elective modules in Computer Science from List GC-B, which must include Comp 3L1 Comp Programming Languages and Comp 3P2 Advanced Programming.				64C

LIST GC-A:
(Unless otherwise indicated, all carry 16 credit points)

Geol 3N1	Environmental Geology
Geol 3M1	Mining & Evaluation
Geol 3P1	Advanced Petrology
Geol 3S1	Advanced Sedimentology (8 credits)
Geol 3T1	Advanced Structural Geology (8 credits)
Geol 3O2	Geology of Ore Deposits
Geol 3D2	Geodynamics
Geol 3V2	Geological Evolution of SA
Geol 3R2	Rock Mechanics
Geol 3E1	Geotechnical Engineering 1 (8 credits)
Geol 3E2	Geotechnical Engineering 2 (8 credits)

LIST GC-B:
(All carry 16 credit points)

Comp 3L1	Comp. Programming Languages
Comp 3N1	Computer Networks
Comp 3A1	Artificial Intelligence
Comp 3G1	Graphics & Modelling
Comp 3P2	Advanced Programming
Comp 3O2	Operating Systems
Comp 3D2	Database Systems
Comp 3X2	Algorithms & Complexity Theory
Comp 3C2	Compilers & Interpreters

PROGRAMME IN GEOLOGICAL SCIENCES

The purpose of this Programme is to produce graduates who have a sound knowledge of and competence in various theoretical and practical aspects of Geology, with possible specialisation in the geology of ore deposits or environmental and engineering applications. Depending on their specialisation, such graduates will be suitable for employment as geologists, environmentalists, or as consultants in the aforementioned areas and in civil engineering projects. They may also make careers as educators or research scientists.

Apart from their scientific expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Curriculum

Table GS-E		**Programme in Geological Sciences**	
		Environmental & Engineering Stream	
Year 1 Semester 1		***Semester 2***	
Geol 1G1 Fundamentals of Geology	8C	Geol 1E2 Brief History of Earth	8C
Geol 1R1 Rocks and Minerals	8C	Geol 1L2 Understanding Landscapes	8C
Chem 1F1 Fundamental Chemistry 1	16C	Colt 1L2 Computer Literacy	16C
Phys 1G1 Gen Physics 1G1 or Biol 1A1 Diversity of Life or Geog 1U1 Urban Environment	16C	Chem 1F2/1G2 or Phys 1G2 Gen Physics or Biol 1C2 Proc & Structures of Life or Envs 1S2 Env Geography	16C
Math 1G1 Gen Maths 1G1	16C	Elective modules	16C
Year 2 Semester 1		***Semester 2***	
Geol 2M1 Mineralogy	16C	Geol 2P2 Petrology	16C
Geol 2T1 Structural Geology	8C	Geol 2W2 Water Resources	8C
Geol 2O1 Soil Resources	8C	Geol 2S2 Geostatistics	16C
Envs 3G1 Geog Info Systems	16C		
Geol 2F8 Geology Field Module – winter semester			8C
Elective modules (unrestricted)			32C
Year 3 Semester 1		***Semester 2***	
Geol 3M1 Mining & Evaluation	16C	Geol 3O2 Geology of Ore Deposits	16C
Geol 3N1 Environmental Geology	16C	Geol 3R2 Rock Mechanics	16C
Geol 3E1 Geotechnical Engineering 1	8C	Geol 3E2 Geotechnical Engineering 2	8C
		Geol 3V2 Geological Evolution of SA	8C
Elective modules at level III from Lists A or B of Rule SD6			40C

Table GS-O		Programme in Geological Sciences	
		Ore Deposits Stream	
Year 1 Semester 1		***Semester 2***	
Geol 1G1 Fundamentals of Geology	8C	Geol 1E2 Brief History of Earth	8C
Geol 1R1 Rocks and Minerals	8C	Geol 1L2 Understanding Landscapes	8C
Chem 1F1 Fundamental Chemistry 1	16C	Colt 1L2 Computer Literacy	16C
Elective modules (unrestricted, but see Rule SD6)			64C
Year 2 Semester 1		***Semester 2***	
Geol 2M1 Mineralogy	16C	Geol 2P2 Petrology	16C
Geol 2T1 Structural Geology	8C		
Geol 2F8 (Geology Field Module – winter semester)			8C
Elective modules in Geology at level II			48C
Elective modules from Lists A, B or C of Rule SD6			32C
Year 3 Semester 1		***Semester 2***	
Geol 3P1 Advanced Petrology	16C	Geol 3D2 Geodynamics	16C
Geol 3S1 Advanced Sedimentology	8C	Geol 3V2 Geological Evolution of SA	8C
Geol 3T1 Advanced Structural Geology	8C	Geol 3O2 Geology of Ore Deposits	16C
Geol 3M1 Mining & Evaluation	16C		
Geol 3F8 (Advanced Field Module – winter semester)			16C
Elective modules at level III from Lists A or B of Rule SD6			32C

PROGRAMME IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

The purpose of this Programme, which leads to the qualification BSc in Computer Science and Information Technology, is to produce graduates who are expert in both the theoretical and practical aspects of computer science, with possible specialisation in applications to business problems. Such graduates will be suitable for employment in the areas of programming, systems analysis, sales, systems support, management informational systems, research, consultancy and education.

Apart from their technical and scientific expertise, graduates will be expected to have an awareness of the social impact of their work, and to exercise responsibility in the practice of their profession.

Entry Requirements:
Subject to the discretion of the Dean, a higher grade pass in Computer Studies may replace the Physical Science/Biology requirement of Rule SD2.

Notes:

(1) Computer Science may also be taken as a major subject in a BSc degree, allowing for a greater flexibility of choice in the construction of a

curriculum. However, **Information Systems & Technology cannot be taken as a major subject in a BSc degree**, and is only recognised within this programme.

(2) **Places in the Programme may be restricted. The final decision on whether a student may continue in the programme will only be taken once he or she has completed the first-year curriculum, and may then depend upon the available places.**

Curriculum

Table IT		**Programme in Computer Science and Information Technology**	
Year 1 Semester 1		***Semester 2***	
Comp 1S1 Computer Science 1A or Comp 1X1 Computer Science 1X	16C	Comp 1S2 Computer Science 1B	16C
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Stat 1S1 Statistics 1A (Note 3)	16C	Elective module from List IT1	16C
Elective modules (Note 1)	16C	Elective modules (Note 1)	16C
Year 2 Semester 1		***Semester 2***	
Comp 2O1 Object-Oriented Programming	16C	Comp 2D2 Data Structures	16C
		Comp 2C2 Computer Organisation	16C
Elective modules from List ITA			48C
Elective modules			32C
Year 3			
Elective modules from List ITB, including Comp 3L1 Comp Programming Languages and Comp 3P2 Advanced Programming			128C

List IT-1

Stat 1S2	Statistics 1B
Math 1O2	Operations Research 1
Acsc 1S2	Actuarial Science 1
IST 1B	Info Systems & Technology 1B[Note 4]

Notes:

(1) For those students intending to continue into level II IST modules, it is recommended that the two 16-credit elective modules at level I be Economics 1A and 1B.

(2) Should a student registered for a BSc in Computer Science and Information Technology not be in a position to register for Comp 2O1 after 4 semesters (6 semesters for students in the Augmented Curriculum) in the Faculty, s/he shall not be permitted to continue in the programme.

(3) With permission of the Dean, the required module Statistics 1A may be replaced by Math 1O2.

(4) Credit obtained for IST 1B shall be counted as 16 of the permitted 32 credits from out-of-faculty modules

LIST ITA (Level II elective modules):
(Unless otherwise indicated, all carry 16 credit points)

Math 2A1	Linear Algebra
Math 2C1	Advanced Calculus 2A
Math 2C2	Advanced Calculus 2B
Math 2M1	Mechanics 2
Math 2O1	Info Security & Ops Research
Math 2N2	Intro Numerical Methods
Math 2D2	Diff Eq & Maths Models
Stat 2A1	Statistics 2A
Stat 2B2	Statistics 2B (32 credits)
IST 2A	Information Systems & Technology 2A
IST 2B	Information Systems & Technology 2B
Econ 2A	Economics 2A
Econ 2B	Economics 2B

LIST ITB (Level III elective modules):
(Unless otherwise indicated, all carry 16 credit points)

Comp 3P2	Advanced Programming
Comp 3A1	Artificial Intelligence
Comp 3N1	Computer Networks
Comp 3G1	Graphics & Modelling
Comp 3X2	Algorithms & Complexity Theory
Comp 3C2	Compilers & Interpreters
Comp 3L1	Comp. Programming Languages
Comp 3D2	Database Systems
Comp 3O2	Operating Systems
IST 3A	Information Systems & Technology 3A (32 credits)
IST 3B	Information Systems & Technology 3B (32 credits)

PROGRAMME IN MATHEMATICAL AND STATISTICAL SCIENCES

The purpose of this Programme is to produce graduates who have a good grasp of the underlying concepts and methods of mathematics and statistics and are capable of

sound mathematical reasoning. They will have good problem-solving and communication skills in mathematics and statistics, and will be reasonably skilled in the use of computers for computational and other purposes.

The programme is intended to equip graduates for careers in the field of Science and Technology, education, research, industry and business, where these depend on mathematical and statistical expertise.

In addition to their professional and technical expertise, graduates will be expected to have awareness of the social impact of their work, and to exercise responsibility in the practice of their professions.

Entry Requirements

Subject to the discretion of the Dean a higher grade pass in Computer Studies may be acceptable in place of the Physical Science/Biology requirement of Rule SD2.

Notes:

Although the programme contains compulsory modules in Computer Science at level I and allows for the inclusion of such modules up to level III, it is not designed to produce the equivalent of a full major in Computer Science.

Curriculum

Table MA		**Programme in Mathematical & Statistical Sciences**	
Year 1 Semester 1		***Semester 2***	
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Stat 1S1 Statistics 1A	16C	Stat 1S2 Statistics 1B	16C
Comp 1S1 or Comp 1X1 Computer Science 1A or Computer Science 1X	16C	Comp 1S2 Computer Science 1B	16C
Electives	16C	Math 1O2 Ops Research 1	16C
Year 2 Semester 1		***Semester 2***	
Math 2A1 Linear Algebra	16C	Math 2C2 Adv Calculus 2B	16C
Math 2C1 Adv Calculus 2A	16C		
Elective modules from List MA			48C
Electives subject to Rule SD6			32C
Year 3			
128 credits in Mathematics, Applied Mathematics, Statistics or approved modules in Computer Science, with the restriction that at least 64 of these 128 credits must come from one of the three subjects: Mathematics, Applied Mathematics or Statistics.			

LIST MA (Level II elective modules):
(Unless otherwise indicated, all carry 16 credit points)

Math 2M1	Mechanics 2
Math 2O1	Info Security & Ops Research
Math 2N2	Intro Numerical Methods
Math 2D2	Diff Eq & Maths Models
Stat 2A1	Statistics 2A
Stat 2B2	Statistics 2B (32 credits)
Comp 2O1	Object-Oriented Programming
Comp 2D2	Data Structures
Comp 2C2	Computer Organisation
Stat 2B2	Statistics 2B (32 credits)

PROGRAMME IN APPLIED SCIENTIFIC COMPUTING

This programme will not be offered in 2004

This Programme leads to the qualification BSc in Applied Scientific Computing. The purpose of the programme is to provide graduates with skills in Scientific Computing, combined with a major in an area of application, such as Physics, Chemistry, or Mathematics, to provide versatile career prospects in the areas of science and technology, education, research, industry and business. The term *Scientific Computing* refers to the application of the computer to scientific problems, to model and analyse a range of quantifiable systems in a scientific way. It is not Computer Science, since it does not deal with the design of computing and information systems, but rather the application of computers to science through programming of numerical methods and data analysis. Scientific Computing requires skills in Mathematics and Computing, combined with a scientific area of application. In addition to their professional and technical expertise, graduates will be expected to have awareness of the social impact of their work, and to exercise responsibility in the practice of their professions.

Curriculum

Table ASC		**Programme in Applied Scientific Computing**	
Year 1 Semester 1		***Semester 2***	
Phys 1S1 Physics 1S1	16C	Phys 1S2 Physics 1S2	16C
Math 1S1 Mathematics 1S1	16C	Math 1S2 Mathematics 1S2	16C
Comp 1S1/1X1 Computer Science 1A/1X	16C	Comp 1S2 Computer Science 1B	16C
Electives subject to Rule SD6			32C
Year 2 Semester 1		***Semester 2***	

Comp 2O1 Object-Orientated Programming	16C	Math 2N2 Intro Numerical Methods	16C
Either:			
Math 2A1 Linear Algebra	16C	Math 2C2 Adv Calculus 2B	16C
Math 2C1 Adv Calculus 2A	16C		
Electives subject to Rule SD6			48C
Or:			
Phys 2M1 (Theoretical Methods)	16C		
Electives subject to Rule SD6			80C
Year 3 Semester 1		***Semester 2***	
Comp 3G1 Graphics & Modelling	16C	Phys 3C2 Scientific Computing	16C
		Phys 3P2 Scientific Computing Project	16C
Electives at level III, subject to Rule SD6			16C
Modules constituting a primary major subject, according to rule SD6			64C

HONOURS PROGRAMMES

BScHons (Chemistry)

Prerequisites: DSC3IN1, 3OR1, 3PH2 and 3IA2, or equivalent modules

The Honours programme in Chemistry consists of core modules in each of Analytical, Inorganic, Organic and Physical Chemistry, given in the first semester, and in the second semester a selection of further topics in up to three of these four areas as well as an Honours project. Students are expected to be able to work independently. The rules of combination are

Analytical Chemistry :	DSC7AC1 (16C) core
Inorganic Chemistry :	DSC7IC1 (16C) core
Organic Chemistry :	DSC7OC1 (16C) core
Physical Chemistry :	DSC7PC1 (16C) core
Honours Project :	DSC7PR2 (32C) compulsory

and topics totalling 32C chosen from among the following electives

Analytical Chemistry :	DSC7AC2 (16C)
Inorganic Chemistry :	DSC7IC2 (16C)
Organic Chemistry :	DSC7OC2 (16C)
Physical Chemistry :	DSC7PC2 (16C)
Special Analytical Chemistry Electives :	DSC7CA2 (8C)
Special Inorganic Chemistry Electives :	DSC7CI2 (8C)
Special Organic Chemistry Electives :	DSC7CO2 (8C)
Special Physical Chemistry Electives :	DSC7CP2 (8C)

BScHons (Biological Sciences with Chemistry)
Prerequisites: 64 level III credits in appropriate modules in the Biological Sciences and 64 level III credits in Chemistry
This stream includes a combination of Honours modules from the Schools of Life and Environmental Sciences, and Pure and Applied Chemistry. The combination of modules must be approved by the Heads of the two Schools. The rules of combination are:

Either

Research Project (Biological Sciences) : DSB7P11/12 (48C)

compulsory electives worth 80C from

Biological Science honours modules (32C or 48C)

And Chemistry honours modules (32C or 48C)

or

Honours Project (Chemistry) : DSC7PR2 (32C)

compulsory electives worth 96C from

Chemistry honours modules (48C or 64C)

and Biological Science honours modules (32C or 48C)

BScHons (Computer Science)
The Honours programme consists of an Honours project and a selection of modules from Computer Science and allied disciplines such as Mathematics, Applied Mathematics, Statistics and Physics. The choice of modules is made in consultation with the director of the Honours programme, and is subject to approval by the Head of School. The rules of combination are:

Honours project : DSX7PRM (32C) *compulsory*

electives from Computer Science honours modules (64C)

electives from Computer Science or other approved honours modules (32C)

BScHonours (Geology and Ore Deposits)
Prerequisites: A good degree in Geology with 16C in level I Chemistry module.
This stream consists of an honours project, field work, and a number of modules made up of core and electives as follows:

Honours project:	DSG7PRM (32C) *compulsory*
Mines Field Class	DSG7MFM (16C) *core*
Ore Deposits	DSG7ODM (16C) *core*
Plus 64C electives from the following:	
Igneous Petrology and Geochemistry	DSG7IPM (16C)

Sedimentology	DSG7SDM (16C)
Structural Geology	DSG7SGM (16C)
Metamorphic Petrology	DSG7MPM (16C)

Any ONE other approved 16C Honours level module in the Science Faculty which is related to Earth Science or Geological Sciences.

BScHonours (Environmental and Engineering Geology)

Prerequisites: A good degree in Geology. Some modules require 16C in a level I Chemistry module while others require 16C in a level 1 mathematics or physics module. A good degree in related disciplines will be considered, but each case will be assessed individually on merit.

This stream consists of an honours project, field work, and a number of modules made up of core and electives as follows:

Honours project:	DSG7PRM (32C) *compulsory*
Mines Field Class	DSG7MFM (16C) *core*

Plus 80C electives from the following:

Engineering Geology	DSG7EGM (16C)
Rock Engineering	DSG7REM (16C)
Pollution Studies	DSG7PSM (16C)
Special Topics	DSG7SPM (16C)
* Environmental Management	DNV4EM1 (8C)
* Environmental Technology	DNV4ET2 (8C)
* Geotech Engineering 3	DNV7GS2 (16C)
* Public Health Engineering	DNV 4PHM (8C)

Any one approved module in the Geology and Ore Deposits stream (16C).

Approved Environmental Science modules to a maximum credit value of 32C.

** Note: School of Civil Engineering, Surveying and Construction.*

BScHons (Biological Sciences)

Prerequisites: BSc (with specialisation in an appropriate area of Biological Sciences)

Rules of combination:

Research Project :	DSB7P11/12 (48C) *compulsory*
Research Skills and Attitudes:	DSB7R11/12 (16C) *compulsory*

and four electives from the following (other modules may be available in addition to this list and a module in this list may not necessarily be offered). A maximum of 32C only from electives at level 8 is permitted.

Internship :	DSB7INM (16C)
Advanced Topics in Behaviour Ecology :	DSB7BEM (16C)
Molecular Systematics and Cytotaxonomy :	DSB7MSM (16C)
Coastal Ecology :	DSB8CEM (16C)
Current Topics in Molecular Biology :	DSB7MBM (16C)
Developmental Biology :	DSB7DBM (16C)
Applied Plant Physiology :	DSB7PPM (16C)
Ecotoxicology :	DSB8EXM (16C)
Fisheries Science :	DSB7FSM (16C)
Marine Biodiversity :	DSB7MDM (16C)
Functional Cell Biology :	DSB7FCM (16C)
Parasitology :	DSB7PSM (16C)
Plant Biotechnology :	DSB7PBM (16C)
Seed Biology :	DSB7SBM (16C)
Systems Ecology :	DSB7SEM (16C)
Resource Modelling	DSB7RMM (16C)
*Wetland Ecology and Management :	DSE7WLM (16C)
*Environmental Impact Assessment :	DSE7EAM (16C)

** Note: Geography and Environmental Science modules*

BScHons (Marine Ecology)
Prerequisites: BSc (with specialisation in an appropriate area of Biological Sciences)
Rules of combination:

Research Project :	DSB7P11/12 (48C) compulsory
Research Skills and Attitudes :	DSB7R11/12 (16C) compulsory
Coastal Ecology :	DSB8CEM (16C) core
Fisheries Science :	DSB7FSM (16C) core
Marine Biodiversity :	DSB7MDM (16C) core
**Coastal and Marine Geology :	DSG7CMM (16C) core

*** Note: offered by Geology - syllabus given in this section*

BScHons (Biological Sciences with Chemistry)
Prerequisites: 64 level III credits in appropriate modules in the Biological Sciences and 64 level III credits in Chemistry

This stream includes a combination of Honours modules from the Schools of Life and Environmental Sciences, and Pure and Applied Chemistry. The combination of modules must be approved by the Heads of the two Schools. The rules of combination are:

Either

Research Project (Biological Sciences) : DSB7P11/12 (48C) compulsory

electives worth 80C from

Biological Science Honours modules (32C or 48C)

and Chemistry Honours modules (32C or 48C)

or

Honours Project (Chemistry) : DSC7PR2 (32C) compulsory

electives worth 96C from

Chemistry Honours modules (48C or 64C)

and Biological Science Honours modules (32C or 48C)

BScHons (Environmental Science)

The rules of combination are:

Research Project:	DSE7P11/12 (32C) *compulsory*
Research Methods:	DSE7MEM (16C) *compulsory*

And five electives, which must include at least 48C from List 1 below, and may include up to 32 credits from List 2 (other modules may be available in addition to the list, and a module in this list may not necessarily be offered)

List 1

**Analytical Chemistry:	DSC7AC1 (16C)
Air Pollution:	DSE7POM (16C)
Biogeomorphology:	DSE7BGM (16C)
***Coastal and Marine Geology:	DSG7CMM (16C)
*Applied Plant Physiology:	DSB7PPM (16C)
Environmental Education:	DSH7EDM (16C)
Environmental Impact Assessment:	DSE7EAM (16C)
*Fisheries Science:	DSB7SM (16C)
*Marine Biodiversity:	DSB7MDM (16C)
****Pollution Studies:	DSG7PSM (16C)
*Systems Ecology:	DSB7EM (16C)
Wetland Ecology and Management:	DSE7WLM (16C)

List 2

Coastal Ecology:	DSB8CEM (16C)
Coastal Zone Management:	DSE8CZM (16C)
Dynamic Meteorology:	DSE8DMM (16C)
*Ecotoxicology:	DSB8EXM (16C)
Geographic Information Systems:	DSE8IFM (16C)
***** Principles of Environmental Economics:	DEC8PE2 (16C)
Remote Sensing:	DSE8REM (16C)
Resource Management:	DSE8RSM (16C)
Sustainable Development:	DSE8SVM (16C)

Notes

** Biology module*

***Chemistry module*

****Marine Ecology module –see entry in Biological Science Honours*

***** Geology module*

******Economics module*

BScHons (Geography & Environmental Management)

The rules of combination are:

Research Project:	DSE7P11/12 (32C) *compulsory*
Concepts:	DSH7CCM (16C) *compulsory*

And five electives, which must include at least 48C from List 1 below, and may include up to 32 credits from List 2 (other modules in this list may not necessarily be offered, and other modules may be available in addition to the list)

List 1

Air Pollution:	DSE7POM (16C)
Biogeomorphology:	DSE7BGM (16C)
Conservation and Society:	DSH7EDM (16C)
Environmental Education:	DSH7EDM (16C)
Environmental Impact Assessment:	DSE7EAM (16C)
Tourism:	DSH7TOM (16C)
Wetland Ecology and Management:	DSE7WLM (16C)

List 2

Coastal Zone Management:	DSE8CZM (16C)

Dynamic Meteorology:	DSE8DMM (16C)
*Environmental Law:	DLA4ELM (16C)
Geographic Information Systems:	DSE8IFM (16C)
Identity, Place and Postcolonialism:	DSH8PPM (16C)
** Principles of Environmental Economics:	DEC8PE2 (16)
Remote Sensing:	DSE8REM (16C)
Resource Management:	DSE8RSM (16C)
Sustainable Development:	DSE8SVM (16C)
Urban Studies:	DSH8UDM (16C)

Notes

** Law module – see entry in Env.Sc level III modules*

*** Economics module*

BScHons (Mathematics)

Rules of combination:

Project :	DSM7PRM (16C) *compulsory*
Classical Algebra :	DSM7CAM (16C) *core*
Functional Analysis :	DSM7FAM (16C) *core*

and 80 credits from the following electives, not all offered in any one year:

Applied Analysis :	DSM7ANM (16C)
Classical Mechanics :	DSM7CMM (16C)
Coding Theory :	DSM7CDM (16C)
Cosmology :	DSM7CSM (16C)
Cryptography :	DSM7CRM (16C)
Differential Geometry :	DSM7DGM (16C)
Financial Mathematics 1A :	DSM7FM1M (16C)
Financial Mathematics 1B :	DSM7FMM (16C)
Foundations :	DSM7FOM (16C)
General Relativity :	DSM7REM (16C)
Graph Theory 1 :	DSM7G1M (16C)
Graph Theory 2 :	DSM7G2M (16C)
Industrial Mathematics :	DSM7INM (16C)
Number Theory :	DSM7NTM (16C)

Numerical Analysis : DSM7NUM (16C)
Ordinary Differential Equations : DSM7ODM (16C)
Partial Differential Equations : DSM7PDM (16C)
Probability Theory : DSS7PTM (16C)
Optimization : DSM7OPM (16C)
Set Theory & Ordered Sets : DSM7SOM (16C)
Special Topics A : DSM7TAM (16C)
Special Topics B : DSM7TBM (16C)
Topology : DSM7TOM (16C)
Universal Algebra : DSM7UAM (16C)

BScHons (Applied Mathematics)
Rules of combination:
Project : DSM7PRM (16C) *compulsory*
and 112 credits from the following electives, not all offered in any one year.
Applied Analysis : DSM7ANM (16C)
Classical Algebra : DSM7CAM (16C)
Classical Mechanics : DSM7CMM (16C)
Coding Theory : DSM7CDM (16C)
Cosmology : DSM7CSM (16C)
Cryptography : DSM7CRM (16C)
Differential Geometry : DSM7DGM (16C)
Financial Mathematics 1A : DSM7FIM (16C)
Financial Mathematics 1B : DSM7FMM (16C)
Foundations : DSM7FOM (16C)
Functional Analysis : DSM7FAM (16C)
General Relativity : DSM7REM (16C)
Graph Theory 1 : DSM7G1M (16C)
Graph Theory 2 : DSM7G2M (16C)
Industrial Mathematics : DSM7IMM (16C)
Number Theory : DSM7NTM (16C)
Numerical Analysis : DSM7NUM (16C)
Optimization : DSM7OPM (16C)

Ordinary Differential Equations :	DSM7ODM (16C)
Partial Differential Equations :	DSM7PDM (16C)
Probability Theory :	DSS7PTM (16C)
Set Theory & Ordered Sets :	DSM7SOM (16C)
Special Topics A :	DSM7TAM (16C)
Special Topics B :	DSM7TBM (16C)
Topology :	DSM7TOM (16C)
Universal Algebra :	DSM7UAM (16C)

BScHons (Mathematical Sciences)

The rules of combination for this stream of the Honours degree are those of the Mathematics, Applied Mathematics, Computer Science, Statistics or Physics stream, but the electives may, with the approval of the Head of the relevant School, be chosen from those offered in any of these disciplines.

Note: not all modules may be offered in any one year.

BScHons (Statistics)

Prerequisites: All level III courses in Statistics or by approval of the Head of the School.

Rules of combination:

Honours Project :	DSS7PRM (16C) *compulsory*

and 112C from the following electives, which may not all offered in any one year:

Advanced Topics in Statistics A :	DSS7ATM (16C)
Advanced Topics in Statistics B :	DSS7TBM (16C)
Bayesian Inference :	DSS7BAM (16C)
Econometrics :	DSS7ECM (16C)
Multivariate Analysis :	DSS7MAM (16C)
Probability Theory :	DSS7PTM (16C)
Queueing Theory :	DSS7QTM (16C)
Random Processes :	DSS7RPM (16C)
Regression Diagnostics :	DSS7RDM (16C)
Sampling Theory :	DSS7STM (16C)
The Generalized Linear Model :	DSS7LMM (16C)
Time Series Analysis :	DSS7TSM (16C)

Note: At most two of the modules, totalling 32 credits, chosen from the above list of electives, may, with the approval of the Head of School, be replaced with courses offered by other disciplines in the School, or in other Schools.

BScHons in Financial Mathematics

Prerequisite: All level III courses in Statistics or by approval of the Head of the School.

Project DSS7FFM (16C) *compulsory*

Rules of combination:

Financial Mathematics 1F will be a compulsory component and 112C must be chosen from the following electives which may not all be offered in one year.

In particular, Financial Mathematics 1F will focus on the practical component of the programme with students being required to complete assignments on various aspects in the financial markets.

Financial Mathematics 1A

Financial Mathematics 1B

Financial Mathematics 1C

Financial Mathematics 1D

Financial Mathematics 1E

Financial Mathematics 1F

Financial Mathematics 1G

Special Topics A

Special Topics B

Time Series Analysis

Econometrics

BScHons (Physics)

Rules of combination:

Electromagnetic Theory :	DSP7EMM (16C) *core*
Quantum Theory :	DSP7QTM (16C) *core*
Mathematical Methods :	DSP7MMM (8C) *core*
Classical Mechanics :	DSP7CMM (8C) *core*
Statistical Mechanics :	DSP7SMM (8C) *core*
Special Relativity :	DSP7SRM (8C) *core*
Physics Project :	DSP7PRM (16C) *compulsory*

and electives totaling 48 credits. Appropriate modules may be taken from other Schools with the approval of the Head of School

BScHons (Applied Physics)
Rules of combination:

Instrumentation and Measurement :	DSP7IMM (8C) *core*
Advanced Electronics :	DSP7AEM (8C) *core*
Data Analysis :	DSP7DAM (8C) *core*
Scientific Project Management :	DSP7PMM (8C) *core*
Applied Physics Project :	DSP7APM (32C) *compulsory*

and electives totalling 64 credits. Appropriate modules may be taken from other Schools with the approval of the Head of School.

BScHons (Physics with Geology)
This stream includes appropriate elective modules from the Physics and Applied Physics Honours (total of 64C), and appropriate elective modules from Geology Honours together with an independent field-work project in Geophysics (64C).

BScHons (Physics with Applied Mathematics)
This stream includes five of the core modules of the Physics Honours stream, excluding Mathematical Methods (56C), a project in Theoretical Physics/ Applied Mathematics (16C), and appropriate modules from the School of Mathematical and Statistical Sciences (64C).

BScHons (Physics with Computer Science)
This stream includes the six core modules of the Physics Honours stream (64C), a project in Physics/Computer Science/Scientific Computing (16C), and appropriate modules from Computer Science Honours (48C).

List of additional Pure and Applied Physics Honours modules:

Solid State Physics :	DSP7SSM (8C)
Superconductivity :	DSP7SCM (8C)
Materials :	DSP7MSM (8C)
Optics :	DSP7OPM (8C)
Plasma Physics :	DSP7PPM (8C)
Atomic Processes in Plasmas :	DSP7ATM (8C)
Electromagnetic Applications :	DSP7EAM (8C)
Quantum Mechanics Applications :	DSP7QAM (8C)
Space Physics :	DSP7SPM (8C)
Geophysics :	DSP7GPM (8C)

Astrophysics :	DSP7ASM (8C)
General Relativity :	DSP7GRM (8C)
Foundations of Quantum Mechanics :	DSP7FQM (8C)
Particle Physics :	DSP7PCM (8C)
Computational Physics :	DSP7CPM (8C)
Transform Methods :	DSP7TMM (8C)
Chaos :	DSP7CHM (8C)
Additional Project 1 :	DSP7P1M (8C)
Additional Project 2 :	DSP7P2M (8C)

MASTERS PROGRAMMES

M Marine & Coastal Management

The coursework Master of Marine & Coastal Management requires the completion of approved graduate modules and a research dissertation. The four coursework modules will be negotiated with each student individually, and will depend on his or her prior learning (qualifications and experience). In particular, three areas of competency are sought: 1) research skills; 2) marine and coastal science; and 3) environmental management, theory and practice. The rules of combination are:

Research Dissertation:	DSB8DIM (64C) *compulsory*

And at least two of the following elective16-credit modules:

Coastal Ecology:	DSB8CEM
Ecotoxicology:	DSB8EXM
*Coastal Zone Management:	DSE8CZM
***Principles of Environmental Economics	DEC8PE2
****Ocean and Coastal Law:	DLA8OLM

And a maximum of two elective 16-credit modules from list below is permitted:

Fisheries Science:	DSB7FSM
Marine Biodiversity:	DSB7MDM
*Environmental Impact Assessment:	DSE7EAM
**Coastal and Marine Geology:	DSG7CMM
**Pollution Studies:	DSG7PSM

Notes

* Geography module

** Geology module

*** Economics module

**** Law Module

Although there are no prerequisites, acceptance of a student for registration in a particular module rests with the Head of School.

MSc (Environmental Science)

The Coursework Masters programme in Environmental Science requires the completion of four approved graduate modules and a research dissertation.

The rules of combination are:

Research Dissertation: DSE8DIM (64C) *compulsory*

and four electives, which must include at least 32C from List 1 below, and may include up to 32 credits from List 2 (other modules may be available in addition to the list, a module in this list may not necessarily be offered)

List 1

*Coastal Ecology:	DSB8CEM (16C)
Coastal Zone Management:	DSE8CZM (16C)
*Ecotoxicology:	DSB8EXM (16C)
Geographic Information Systems:	DSE8IFM (16C)
Internship:	DSE8INM (16C)
Remote Sensing:	DSE8REM (16C)
Resource Management:	DSE8RSM (16C)
Sustainable Development:	DSE8SVM (16C)
**** Principles of Environmental Economics:	DEC8PE2 (16C)

List 2

Air Pollution:	DSE7POM (16C)
Biogeomorphology:	DSE7BGM (16C)
**Analytical Chemistry:	DSC7AC1 (16C)
*Applied Plant Physiology:	DSB7PPM (16C)
***Coastal and Marine Geology:	DSG7CMM (16C)
Environmental Education:	DSH7EDM (16C)
Environmental Impact Assessment:	DSE7EAM (16C)
*Fisheries Science:	DSB7FSM (16C)
*Marine Biodiversity:	DSB7MDM (16C)
Research Methods:	DSE7MEM (16C)
*Systems Ecology:	DSB7EM (16C)
Wetland Ecology and Management:	DSE7WLM (16C)

Notes

** Biology module*

*** Chemistry module*

**** Marine Ecology module –see entry in Biological Science Honours*

***** Economics module*

MEnvironmental Management

The coursework Masters of Environmental Management requires the completion of 128C in total.

The rules of combination are:

Either

Research Report:	DSE8RRM (32C) *compulsory*
Tools of Environmental Management:	DSE8EMM (16C) *compulsory*
Sustainable Development:	DSE8SVM (16C) *compulsory*

and four electives, which must include at least 32C from List 1 below, and may include up to 32C from List 2 (other modules may be available in addition to the list, and a module in this list may not necessarily be offered)

Or

Research Dissertation	DSE8DIM (64C) *compulsory*
Tools of Environmental Management:	DSEEMM (16C) *compulsory*
Sustainable Development:	DSE8SVM (16C) *compulsory*

and any two electives from Lists 1 and 2 below (other modules may be available in addition to the list, and a module in this list may not necessarily be offered)

List 1

Coastal Zone Management:	DSE8CZM (16C)
Geographic Information Systems:	DSE8IFM (16C)
Internship:	DSE8INM (16C)
Remote Sensing:	DSE8REM (16C)
Resource Management:	DSE8RSM (16C)
** Principles of Environmental Economics:	DEC8PE2 (16C)

List 2

Air Pollution:	DSE7POM (16C)
Biogeomorphology:	DSE7BGM (16C)
Conservation and Society:	DSH7CSM (16C)
Environmental Education:	DSH7EDM (16C)
Environmental Impact Assessment:	DSE7EAM (16C)
*Environmental Law:	DLA4ELM (16C)
Research Methods:	DSE7MEM (16C)

Tourism:	DSH7TOM (16C)
Wetland Ecology and Management:	DSE7WLM (16C)

Notes

** Law module-see entry in EnvSc III modules*

*** Economics module*

INTRODUCTION TO SYLLABI

1 This section of the Handbook contains information pertaining to the various schools in the Faculty and the modules offered within those Schools.

2 Not all listed modules will necessarily be offered each year and the semester in which they are offered may also vary from that listed here. Students should consult the relevant Head of School for further information in this regard.

3 The notional study hours legend given with the syllabus for each module is interpreted as: L = lectures, T = tutorials, P = practicals/ field trips, S = seminars, R = revision, H = self-study, F = internship, A = assessment and exams.

SCHOOL OF PURE AND APPLIED CHEMISTRY

The School offers modules and a programme in Chemistry and Applied Chemistry. Students wishing to read for a degree in Chemistry may follow the programme in Pure and Applied Chemistry, or may take Chemistry as a major with other subjects, such as Cellular Biology or Physics (for example) as second major.

Notes:

(1) To enter any level II module in Chemistry, a student is required to obtain a mark of at least 55% (pass-proceed) in Chemistry 1F2 or Chem 1B2. Students with a mark in the range 50-54% will obtain credit for Chem 1F2/1B2, but also qualify for a special examination to give them a further opportunity to achieve the pass-proceed level.

(2) Practical work and underlying theory are assessed in all modules throughout both semesters

(3) For the purposes of prerequisite or co-requisite requirements, the modules Chem 1F1 and Chem 1B1 are equivalent (the latter being intended for students in the special 'augmented' 4-year curriculum). The same applies to the modules Chem 1F2 and Chem 1B2.

(4) A full first-year curriculum in Chemistry comprises Chem 1F1 and 1F2 (or equivalents – see Note 3). This is a requirement for entry to any of the level II modules in Chemistry (Chem 2A1, 2L1, 2P1, 2I2, 2O2, 2S2).

(5) Students planning to major in Chemistry should ensure that they take 32 credits in Mathematics in their first year, and the Physics modules Phys 1S1 and 1S2 no later than in their second year.

(6) Honours and Postgrad: Students will be admitted to the Honours programmes on the basis of a suitable undergraduate curriculum in which satisfactory results were obtained. In compiling a programme of study, it is possible to take combinations of modules from various disciplines, agreed to by the Head of School.

The school also offers very strong research Masters and PhD programmes, in a

variety of topics. Only students with an excellent Honours degree will be admitted. Entry to all Honours streams is by selection.

SCHOOL OF GEOLOGICAL AND COMPUTER SCIENCES

The School offers courses and programmes in the broad areas of Computer Science (described in Section A below) and the Geological Sciences (described in Section B). It also offers an interdisciplinary programme in Geocomputing, which combines elements of both areas.

Students wishing to read for a degree in Computer Science may follow the programmes in Computer Science and Information Technology or in Geocomputing, or may take a double major in Computer Science, or may take Computer Science as a major with other subjects such as Mathematics, Statistics or Economics (for example) as second major.

Students wishing to read for a degree in Geology may follow the programmes in Geological Sciences or Geocomputing, or may major in Geology, or Environmental & Engineering Geology, or both, or combine one of these with other major subjects such as Environmental Science, Geography & Environmental Management, Physics or Chemistry (for example).

SECTION A: COMPUTER SCIENCE

Notes:

(1) To enter any level II module in Computer Science, a student is required to obtain a mark of at least 55% (pass-proceed) in Comp 1S2 Computer Science 1B or Comp 1B2. Students with a mark in the range 50-54% will obtain credit for Comp 1S2/1B2, but also qualify for a special examination to give them a further opportunity to achieve the pass-proceed level.

(2) All Computer Science modules have a sub-minimum requirement of 40% on each component of the final mark (i.e. the class record and exam mark(s)). Students failing to achieve 40% in any of the exam papers shall be awarded a supplementary exam for the module provided their average mark for the module is over 40%.

(3) **Entry into both Computer Science I and Computer Science II may, in any year, be restricted in numbers by the School. The decision will depend on the available physical and academic resources.**

(4) For the purposes of prerequisite or co-requisite requirements, the modules Comp 1S1, Comp 1X1 and Comp 1B1 are equivalent (the latter being intended for students in a special augmented 4-year curriculum). The same applies to the modules Comp 1S2 and Comp 1B2.

(5) In the context of Rules SD6(1) and SD6(6), the two modules in Computer Literacy (Colt 1L1 and Colt 1L2) are regarded as being 'outside' the Faculty, except for students enrolled for a curriculum leading to a major in Geology or

Environmental and Engineering Geology, in which it is prescribed as a 'core' module.
(6) No credit will be given for the module IST 1A (offered in the Faculty of Management Studies) in addition to any of Comp 1S1, Comp 1X1, Comp 1B1, Comp 1S2, Comp 1B2, Colt 1L1 or Colt 1L2.

SECTION B: GEOLOGICAL SCIENCES

Notes:
(1) Students intending to pursue a career in Geology are advised to take modules in Chemistry, Computer Science, Mathematics or Physics.
(2) Students intending to proceed to Honours in Environmental & Engineering Geology should also take note of the Mathematics or Physics requirement.
(3) Fieldwork is an integral part of Geology and attendance at field classes is compulsory. These take place at weekends or during vacations. A calendar of field classes is published early in the first semester of the academic year.
(4) For students enrolled in this curriculum, the modules in Computer Literacy Colt 1L1 and Colt 1L2, being 'core' modules, are regarded as falling within List C of Rule SD6. Normally, these modules are regarded as 'outside modules' in terms of Rule SD6(1) and SD6(6).
(5) Approximately R650 will be added to the fees for the field module Geol 2F8 for the purchase of a compulsory field kit. The exact cost will depend on the retail cost of the individual items in the kit which will be purchased in bulk by the School. There will also be charges for coursework notes at all levels.
(6) Admission to Honours is conditional on a satisfactory academic record.
Candidates shall complete an Honours project involving independent fieldwork or laboratory work or both. Supervised fieldwork is undertaken in the Mines Field class, and may also be carried out in other individual modules.

SCHOOL OF LIFE AND ENVIRONMENTAL SCIENCES

The School offers courses and programmes in two separate but interrelated groups of disciplines: the Biological Sciences (described in Section A) and Environmental Science and Geography & Environmental Management (described in Section B). In addition, the School, in conjunction with the Faculty of Medicine, offers a programme in Bio-Medical Sciences.

SECTION A: BIOLOGICAL SCIENCES

Notes:
(1) The School offers focused programmes leading to the BSc in Bio-Medical Sciences, and in Biological Sciences, as well as offering the three subjects Cellular Biology, Environmental Biology and Biological Sciences (which encompasses both) as majors in the BSc degree. It is important to note that for all these i.e. the

programme in Biological Sciences or Bio-medical Sciences, or any of the three biological subjects in the BSc degree it is compulsory to take the three level I Biological Sciences modules (Biol 1A1, Biol 1C2 and Biol 1D2)

(2) Detailed curricula and other information on the BSc in Biological Sciences and BSc in Bio-Medical Sciences programmes will be found in the Programmes section of the Handbook, whilst information on the three major subjects offered by the School is given in the Notes below (see particularly 8, 9 and 10).

(3) **Prospective students should note that, because of limited capacity, the number of students who may enter the second level of study in Biological Sciences or in the BSc in Bio-Medical Sciences programmes in any particular year may have to be restricted. The final decision on selection into the BSc in Bio-Medical Sciences Programme will be made after students have completed the first semester of the first year curriculum, and selection will be on academic merit.**

(4) Those who, on completion of the 1st Semester of level I curriculum, cannot continue in their chosen programme will be able to transfer to a different programme or to a BSc with a choice of major subjects.

(5) It will be noted that entry into certain level II modules in Biological Sciences require the two level I Chemistry modules Chem 1F1 and 1F2 or Chem 1G2. With permission of the Board of the Faculty, students who have attended but not obtained credit for these Chemistry modules may be permitted to register for the failed module or modules concurrently with the level II or level III modules for which they are prerequisite. The Chemistry modules will then be treated as co-requisite modules. Note that this concession is granted only if students have passed all other courses, and have attained an average of at least 60% in the three prescribed modules in the Biological Sciences.

(6) Students in certain modules, particularly in the Environmental Biology and Biological Sciences majors, shall be required to participate in compulsory field classes during vacations and over weekends, at times to be determined by the School. Such students will be required to contribute to the cost of the field classes, the amount depending on the nature and duration of the class involved. Other forms of off-campus activity may also be a requirement for modules in the Biological Sciences curricula.

(7) Students who are taking a double major, and where the second major requires a research project module, must take only one project which may be from either discipline, i.e. the core requirement of Biol 3R1/2 Research Project will fall away if students complete an alternative research project module that is approved by the Biological Sciences Programme Director.

(8) Students should take careful note of the prerequisite and co-requisite requirements of modules in their planned curriculum.

(9) The modules Biol 1U1 Diversity of Life: (Aug), Biol 1X2 Processes and Structure: (Aug) and Biol 1Y2 Molecules to Organisms: (Aug) are intended for students who are registered for a special four-year augmented curriculum. For the

purposes of prerequisite or co-requisite requirements, they are entirely equivalent to the corresponding modules, Biol 1A1, Biol 1C2 and Biol 1D2.
(10) The modules offered in the Augmented Curriculum Programme will be Biol 1U1 Diversity of Life: (Aug) which will be offered every year, and Biol 1X2 Processes and Structure: (Aug) will be offered in 2004 but not in 2005; and Biol 1Y2 Molecules to Organisms: (Aug) will be offered in 2005 but not in 2004.
(11) The semester in which a module is offered may change from year to year
(12) **Note that the subminimum of 40% is applied to final theory examinations in all Biological Sciences modules**
(13) Honours programmes are available to selected graduates and aim to train students in the theoretical and practical skills required by the professional biologist. Studies in both pure and applied biological topics are available. In particular the programmes consist of theory components (to enlarge the depth of theoretical knowledge and application within selected fields) and training in research project development and management, modern methods of scientific investigation and reporting, communication skills and ethics. The programmes extend over one academic year (no vacation periods) and consist of a number of modules. Students select a number of elective modules that may cover a wide variety of subject matter or may specialise in specific areas of modern biology. In addition, all students undertake a compulsory theoretical module on general research skills, and a research project. There is also the option of undertaking a mini research project linked to an Industry Placement Programme (Internship).
Students are required to attend all scheduled activities in all modules, unless special permission has been granted by the Head of School.

SECTION B: ENVIRONMENTAL SCIENCE AND GEOGRAPHY & ENVIRONMENTAL MANAGEMENT

Notes:
(1) There is a degree of overlap between the curricula for both *Environmental Science and Geography* as major subjects and that for *Environmental Management*; both involve a balance between science and other subjects. For this reason, **the BSc degree cannot have both Environmental Science and Environmental Management, or Geography and Environmental Management as major subjects.**
(2) It should be noted that Environmental Management falls within List B of Rule SD6(4), **and may therefore only be taken in conjunction with a second major from List A** (other than Environmental Science or Geography).
(3) It is not allowed to obtain credit for both Envs 2A2 (Environmental Auditing) and Envs 2W2 (Environmental Auditing and Welfare Economics).
(4) Students must plan their curricula with care to ensure that they satisfy all prerequisite requirements for modules which they may wish to take at higher levels.
(5) Certain modules include compulsory field visits, which take place over weekends

or during vacations at times that will be determined by the School. These are indicated in the module descriptions below. Participation is mandatory, and participants may be required to contribute towards transportation and accommodation costs.
(6) Students who are taking a double major, and where the second major requires a research project module, must take only one project which may be from either discipline, i.e. the core requirement of Envs 3P2 Research Project will fall away if students complete an alternative research project module that is approved by the Environmental Science Programme Director.
(7) The Honours programmes in Geography and Environmental Sciences require the completion of six approved graduate modules and a research project. Candidates should consult the Head of the School to ensure that they have completed the necessary undergraduate prerequisites for each of the selected modules.

SCHOOL OF MATHEMATICAL AND STATISTICAL SCIENCES

(1) The School offers four separate but interrelated disciplines, namely Mathematics and Applied Mathematics (described in Section A), and Statistics and Actuarial Science (described in Section B). Mathematics, Applied Mathematics, Statistics and Actuarial Science may all be taken as major subjects in the BSc degree (see rule SD6); Actuarial Science is also offered as a focused programme. For details of this Programme, refer to the Programmes section of the Handbook.
(2) Students will be admitted to the Honours programmes on the basis of a suitable undergraduate curriculum in which satisfactory results were obtained. In compiling a programme of study, it is possible to take combinations of modules from various disciplines, agreed to by the Head of School.
The school also offers very strong research Masters and PhD programmes, in a variety of topics. Only students with an excellent Honours degree will be admitted.

SECTION A: MATHEMATICS AND APPLIED MATHEMATICS

Notes:
To proceed to level II module in Math 2C1 in Mathematics, students are required to obtain a mark of at least 55% ('pass-proceed') in Math 1S2 or Math 1B2. (Students with a mark in the range 50-54% shall be given credit for the module and will qualify for a special examination to give them a further opportunity to achieve the pass-proceed level.)

SECTION B: STATISTICS AND ACTUARIAL SCIENCE

Notes:
Statistics:
Students wishing to proceed to an Honours degree in Statistics are strongly advised to take all of the Mathematics level II modules, Math 2A1 Linear Algebra, 2C1 Advanced Calculus 2A and 2C2 Advanced Calculus 2B

Actuarial Science

(1) It is stressed that the Actuarial Science modules Acsc 1A2 Actuarial Science 1, Acsc 2F1 Financial Mathematics, Acsc 2A2 Actuarial Mathematics, Acsc 3S1 Stochastic Modelling and Acsc 3A2 Financial Economics are available to *all* students who have the necessary prerequisites. These modules and a major in Actuarial Science are valuable not only for those who wish to become actuaries, but also to anyone interested in pursuing a career in financial mathematics or portfolio management.

(2) To proceed into level-2 modules in Actuarial Science, all level-1 modules must have been passed at the first attempt, with marks of 70% or more required for Maths 1S1 and AcSc 1A2

The following modules are *highly recommended* for those wishing to major in Actuarial Science:

Economics 1A and 1B (these two modules leading to a possible exemption from Subject 107 of the U.K. Institute of Actuaries), and Comp 1X1 Computer Science 1X or Comp 1S1 Computer Science 1A.

SCHOOL OF PURE AND APPLIED PHYSICS

Students wishing to read for a degree in Physics may combine Physics with other major subjects such as Mathematics, Applied Mathematics or Computer Science (for example). In addition, the School offers an attractive array of modules for inclusion in curricula not necessarily leading to a major in Physics.

Notes:

(1) With the permission of the Board, students who have attended but failed a Maths prerequisite for a Physics module (at any level) may proceed into this Physics module and take the failed Maths module concurrently, and they will be treated as co-requisites.

(2) It should be noted that Math 1G1 and Math 1G2 are not suitable for entry to level-2 Physics modules

(3) Admission to the Honours course is not automatic and depends on the attainment of a sufficiently high standard in undergraduate courses.

For the BScHons (Physics) the prerequisite requirements are the level III modules DSP3QM1, DSP3PB1 and DSP3SS2, or equivalents.

The same prerequisites apply to the BScHons (Physics with Applied Mathematics) and BScHons (Physics with Computer Science).

For the BScHons (Applied Physics) and the BScHons (Physics with Geology) the prerequisite requirements are the level III modules DSP3QM1 and DSP3PB1, or equivalents.

SCIENTIFIC WRITING and REPORTING

Modules offered to students in a special 4-year curriculum.

Notes:

(1) All students who are registered for a special 4-year Augmented Curriculum have to take the two modules in Sci Writing & Reporting in their first year. Other students may take it with special permission of the Dean.

(2) There will be compulsory field trips over weekends or on weekday afternoons.

(3) Students in their second or third year of study may only take the modules with the Dean's permission.

School of Economics and Management

The School, which resides in the Faculty of Management Studies, offers a major in Economics in the BSc degree. In terms of Rule SD6(iv), this major can only be taken if accompanied by a major subject from list A of that rule.

Economics modules may also be included in curricula for which it is not a major subject and as electives in some programmes offered by the Faculty.

School of Anthropology and Psychology

(1) The School, which resides in the Faculty of Community and Development Disciplines (C.A.D.D.), offers a major in Psychology in the BSc degree. In terms of Rule SD6(4), this major can only be taken in conjunction with a major subject from list A of that rule.

(2) Modules from the subject may also be included in curricula for which it is not a major subject. Psychology modules are specified as electives in some Programmes offered by the Faculty.

(3) For admission into Level II Psychology, candidates are required to obtain a minimum mark of 50% for both Psychology 1A and 1B in each of the following: the class mark, the multiple choice sections of the examinations (or exam-equivalent tests), and the written (open-ended) sections of the examinations (or exam-equivalent tests); as well as obtaining 128 credit points in total from all their first year courses. Candidates who pass Psychology 1A and 1B, but fail to meet the above criteria, will receive the stipulated credit points but will not be permitted to proceed to Level II Psychology.

In terms of Rule SD6(iv), Psychology can only be taken as a major if accompanied by a major subject from List A

SYLLABI

Biological Sciences

Offered in the School of Life and Environmental Sciences

BIOL1A1 - Diversity of Life

(DSB1EA1) (49L-0T-39P-0S-66H-0R-0F-6A-13W-16C)

Content: Origin of life, geological history, chemical composition of the early atmosphere. Introduction to the theory of evolution. Introduction to systematics. Evolution of the major groups of organisms. Species diversity. Co-evolution of plants and animals. Anthropogenic impacts on diversity. Role of humans in increasing extinction rates. Economic value of biodiversity.

Assessment: Class record (40%), 3-hour written examination (60%).

BIOL1C2 - Processes & Structures of Life

(DSB1EC2) (49L-0T-39P-0S-66H-0R-0F-6A-13W-16C)

Content: Biologically significant aspects of the physical environment. Basic processes associated with life. Biological implications of size and shape. Major physiological processes and attributes in plants and animals and the nature of the associated organ structures.

Assessment: Class record (40%), 3-hour written examination (60%).

BIOL1D2 - From Molecules to Organisms

(DSB1CD2) (49L-0T-39P-0S-66H-0R-0F-6A-13W-16C)

Content: Structure of amino acids, proteins, carbohydrates, lipids and nucleic acids. Discovery and structure of DNA, DNA replication, RNA transcription, genetic code, translation, control of gene expression. Assembly of membranes, organelles, and cytoplasm, trafficking in the cell, enzyme catalysis, bioenergetics. Structure of the fertilised egg, cleavage patterns, gastrulation and organogenesis of lower vertebrates, embryology of amniotes, cellular basis of morphogenesis, molecular control of pattern development, co-ordination of plant growth, photoperiodism and flowering.

Assessment: Class record and practical examination (40%), 3-hour written examination (60%)

BIOL1U1 - Diversity of Life (Aug)

(DSB1EU1) (49L-39T-68P-0S-0H-0R-0F-0A-13W-16C)

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of BioE 1A1 Diversity of Life – see above, but students have a substantial amount of additional tuition through tutorials and practical classes.

Assessment: Class record (40%), 3-hour written examination (60%).

BIOL1X2 - Processes & Structure (Aug)

(DSB1EX2) (49L-39T-68P-0S-0H-0R-0F-0A-13W-16C)

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Biol 1C2 Processes and Structure – see above but students have a substantial amount of additional tuition through tutorials and practical classes.

Assessment: Class record (40%), 3-hour written examination (60%).

BIOL1Y2 - From Molecules to Organisms (Aug)

(DSB1CY2) (49L-39T-68P-0S-0H-0R-0F-0A-13W-16C)

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Biol 1D2 Molecules to Organisms– see above but students have a substantial amount of additional tuition through tutorials and practical classes..

Assessment: Class record and practical examination (40%), 3-hour written examination (60%).

Will not be offered in 2004

BIOL2A1 - Animal Ecophysiology

(DSB2EJ1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Biol 1A1, Biol 1C2, Chem 1F1 and Chem 1F2 or Chem 1G2.

Content: Homeostasis and control theory. Oxygen and temperature as limiting factors to life; properties of water related to physiological functioning of animals. Animal energetics, movement and biomechanics. Thermoregulation; gas exchange and gas transport; excretion and osmoregulation; digestion and absorption.

Assessment: Class record (50%), 3-hour written examination (50%).

BIOL2C1 - Biochemistry

(DSB2CB1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Biol 1D2, Chem 1F1 and Chem 1F2 or Chem 1G2

Content: Experimental techniques, introductory bioenergetics and metabolism of carbohydrates, lipids and nitrogen compounds.

Assessment: Class record (40%), practical examination (20%), 3-hour theory examination (40%).

BIOL2D2 - Biodiversity across Habitats

(DSB2DH2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 32 credits at Level I from modules in Biological and/or Environmental Sciences.

Content: Description of biomes of South Africa and key habitat descriptors and characteristics. Current concepts in biodiversity. Marine, esturine, freshwater and terrestrial communities focussing on invertebrates. There may be a field trip on a Saturday.

Assessment: Class record (40%), 3-hour practical examination (30%), 2-hour written examination (30%)

Note: This module may not be offered in 2003

BIOL2E2 - Plants & Environment

(DSB2PE2) (14L-0T-18P-0S-46H-0R-0F-6A-13W-8C)

Prerequisite: Biol 1C2, Chem 1F1

Content: This module provides an overview of the functions of whole plants in relation to the environment. It takes a systems approach to the study of plant physiology, but the interrelationships among systems and their relationship to growth are emphasised.

Specific topics to be covered are:

Plant water relations: long distance transport, ascent of sap, functional xylem anatomy; stomatal physiology; transportation; evapotranspiration, water use by stands of plants.

Photosynthesis; influence of environmental parameters on carbon fixation; C_3, C_4 and CAM pathways.

Translocation of carbohydrates; phloem structure; different hypotheses concerning the mechanisms of translocation.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL2F2 - Applied Field Techniques

(DSB2BI2) (2L-0T-48P-0S-24H-0R-0F-6A-6W-8C)

Prerequisite: At least 32 credit points at level I from modules in Biological and/or Environmental Sciences

Content: Field sampling techniques and associated problems; analysis and interpretation of sampling data, indices of biodiversity; morphospecies concept; specimen accessioning. The module includes a 7 day field trip, covering estuarine, freshwater, and terrestrial habitats.

Assessment: Class record (35%), field trip reports (35%), 2-hour written examination (30%).

BIOL2G1 - Classical Genetics

(DSB2CG1) (14L-9T-0P-0S-53H-0R-0F-4A-6W-8C)

Prerequisite: Biol 1D2

Content: Cellular reproduction, chromosomes, genes and alleles. Mendian and population genetics; applications in medicine, agriculture and conservation.

Assessment: Class record (50%), 2-hour written examination (50%)

BIOL2H2 - Microbiology & Health

(DSB2CE2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 1D2

Content: Overview of metabolic pathways, aerobic and anaerobic organisms. Bacteria and human health: normal flora and opportunism, modes of transmission and pathogens of the respiratory system, enteric bacteria, Gram-positive endospore formers, Gram-positive actinomycetes. Virology: size classification and structure of viruses, viral replication. Viruses of relevance to health: influenza, rabies, hepatitis, herpes, HIV, tumour viruses.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL2I2 - Basic Immunology

(DSB2CC2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 1D2, Biol 2C1, Chem 1F1 and Chem 1F2 or Chem 1G2

Content: Introduction to immunity and the immune system. Immunoglobulins. Antigen binding sites, variable regions, hyper variable regions, constant regions, antibody classes, primary and secondary responses. Antigen-antibody interaction. Thermodynamics of antigen-antibody interaction. Lymphocyte populations, haemopoietic tissue. Maturation phases of haemopoietic elements. The immune response. Genetic control of antibody expression. Surface receptors of the immune system. Signal transduction.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL2L1 - Evolution and Life

(DSB2EL1) (14L-18T-0P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Any level I 16 credit Biological Science module

Content: The origin and development of Darwin's evolutionary concepts. Principles of natural selection and evolution. Evolutionary change and life on earth. Introduction to the species concept. Human evolution.

Assessment: Class record (40%), 2-hour written examination (60%)

BIOL2M2 - Molecular Biology

(DSB2CD2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Biol 1D2, Chem 1F1 and Chem 1F2 or Chem 1G2

Content: Nucleic acid structure: DNA, RNA, Z-DNA, supercoiling, chromosome structure in prokaryotes

and eukaryotes. DNA sequencing, reassociation kinetics and repeated sequences in DNA, restriction endonucleases and mapping, overlapping genes, intervening sequences, genome size and the C-value paradox, transcription, genetic code, mutagenesis, translation, control of gene expression.

Assessment: Class record (50%), 3-hour written examination (50%).

BIOL2P1 - Parasites & People

(DSB2EH1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 1A1 or Biol 1C2

Content: An introduction to parasitism, adaptations to the parasitic life-style and relevant aspects of the biology of the common ecto- and endo-parasites (protists, helminths and arthropods) affecting people in South Africa. Where appropriate, the basic epidemiological parameters defining the status of a disease in space and time are also discussed

Assessment: Class record (40%), practical examination (20%), 2-hour written examination (40%).

BIOL2S2 - Protein Structure & Function

(DSB2CA2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 1D2,Chem 1F1 and Chem 1F2 or Chem 1G2

Content: Biological catalysts. Enzyme kinetics - derivation of the Michaelis-Menton and straight-line enzyme kinetic equation. Determination of V_{max} and K_m. Enzyme inhibition and regulation. Protein structure – primary, secondary, tertiary, quaternary levels.
Appropriate examples of functional implications of protein structure.

Assessment: Class record (20%), project (30%), 2-hour written examination (50%).

BIOL2T1 - Biological Sciences Toolkit

(DSB2ST1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: A least 32 credits at Level I from modules in Biological and/or Environmental Sciences

Content: Development of general skills in the Biological Sciences. The Scientific Method as applied to the Biological Sciences. Experimental design, sampling strategies and observational skills. Data synthesis, analysis, presentation and interpretation. Scientific reporting in the Biological Sciences. .

Assessment: Class record (50%), 2-hour examination (50%)

BIOL3B2 - Behavioural Ecology 2

(DSB3EM2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 48 credit points at level II from modules in Biological or Environmental Sciences

Content: Elaboration of behavioural strategies relating to spatial use under different social circumstances. Topics include: Territoriality and spatial ecology, population demography, reproduction and sociality. Focus on current conservation issues through case studies of lions, elephants and rhino. Individual GIS based project on spatial ecology of chosen species.

Assessment: Class record (50%), 2-hour written examination (50%)

BIOL3C2 - Plant Biochemistry

(DSB3CQ2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 2C1, Biol 2S2

Content: Light reactions of photosynthesis: the photosynthetic unit; photosynthetic electron flow; regulation of the light reaction: reactive oxygen species; chemiosmotic theory and ATP synthesis. Photosynthetic carbon dioxide assimilation: reductive pentose phosphate (RPP) pathway; sucrose synthesis; starch synthesis; regulation of RPP pathway; interrelationship between starch synthesis, sucrose synthesis and sucrose breakdown. Photorespiration; oxygenase activity of rubisco; photorespiratory carbon flow; photorespiratory nitrogen flow; C_4 and CAM photosynthesis; biochemistry of C_4 and CAM pathways. Techniques in modern plant biochemistry.

Assessment: Class record (25%), Assignment – experimental techniques (25%), 2-hour theory examination (50%).
Will not be offered in 2004

BIOL3E1 - Community Ecology
(DSB3EL1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)
Prerequisite: At least 48 credits at Level II from modules in Biological or Environmental Sciences
Content: A review of the determinants of species composition and dynamics in assemblages of plants and animals. The determinants reviewed include climatic factors such as temperature and rainfall, fire, various soil factors, various types of interactions between organisms, atmospheric conditions, and biogeographic factors. The module is designed to increase depth of understanding of ecological systems, as well as develop skills in systems thinking and techniques for understanding dynamics in ecological systems. The emphasis in the course is on southern African terrestrial, aquatic and marine environments. An assignment from a list of topics on a particular aspect of community ecology is an integral part of the course. This may either be field or laboratory based.
Assessment: Class record (15%), assignment (35%), 3-hour written examination (50%).

BIOL3F1 - Functional Cell Architecture
(DSB3CB1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)
Prerequisite: Biol 2C1 and Biol 2S2
Content: Cell structure and function. Membrane structure. Properties and biophysics of intracellular water. Cytomatrical, intra-nuclear and intra-organellar spatial organisation. Membrane biosynthesis and flow. Endomembrane system. Exo- and endocytosis. Origin and functions of non-endomembrane-derived organelles. Intra- and extracellular co-ordination of metabolism by chemical and electrical signalling. Long range signalling and whole organism responses. Theory and practice of microscopy and practice of image recording. Cytochemistry and ICC, autoradiography, micro-analysis.
Assessment: Class mark (35%), Open-book examination (45%), Practical Theory Examination (20%).

BIOL3G2 - Plant Growth & Development
(DSB3CN2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)
Prerequisite: Biol 2C1 or Biol 2E1
Content: Signal transduction. Growth, development and differentiation of plant cell walls and tissues. Phytochrome. Biosynthesis metabolism and transport of auxins, gibberellins, abscisic acid and cytokinins, and their physiological roles. Ethylene biosynthesis and physiological effects. Control of flowering. Post harvest physiology.
Assessment: Class record (50%), 2 hours written examination (50%)
Will not be offered in 2004

BIOL3H2 - Behavioural Ecology 1
(DSB3EZ2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)
Prerequisite: At least 48 credits at level II Biological or Environmental Sciences
Content: Behavioural strategies, and concept of multiple strategies. Factors affecting individual fitness: predation risk, starvation risk, competition, parasitism, reproduction, physiological factors, and abiotic factors. Integration of the above concepts into understanding the behavioural strategies of individuals in the context of their environment using case studies: Gerbils, sparrows, and others. Experimental project running over the course of the module.
Assessment: Class record (50%), 2-hour written examination (50%).

BIOL3I1 - Comparative Immunology

(DSB3CG1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 2I2 or MedS2G2

Content: Histocompatibility systems. Rejection of transplantation: acute and chronic graft rejection, mechanisms of rejection, role of immunoglobulins in rejection. Defence mechanisms in invertebrates and vertebrates. Evolutionary significance of defence mechanisms. Phylogenetic implications and the immune tree of life. Parsimony technique for the construction of phylogenetic trees. Application of serological methods to evolutionary questions.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL3M2 - Marine Animal Ecophysiology

(DSB3EI2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 2A1

Content: This module concerns the physiological function of animals in relation to the marine environment. The physiological function at the whole organism level is emphasized. Physiological data is analyzed to gain a better understanding of the distribution, abundance and evolution of animals in various marine ecosystems.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL3N2 - Environmental Microbiology

(DSB3EG2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: 48 credits at level II in Biological or Environmental Sciences

Content: Structure and function of prokaryotic and eukaryotic micro-organisms; classification of bacteria and fungi; morphology, biochemistry and molecular techniques; growth, metabolism and culture of bacteria and fungi;
Host-parasite relationships and symbiotic associations; bacteria and fungi in terrestrial, aquatic and aerial environments; industrial, food and waste applications; biotechnological applications.

Assessment: Class record (50%), 3-hour written examination (50%).

BIOL3O1 - Co-ordination of Metabolism

(DSB3CP1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Corequisite: Biol 2C1, Biol 2S2

Content: Basic principles: levels of co-ordination, experimental analysis. Intracellular electrical signalling: ions, gradients, transmembrane pumps, transport. Intracellular chemical signalling: transport across membranes, signal transduction, second messenger systems. Intercellular co-ordination: short range co-ordination via chemical messengers and across cell junctions, long range co-ordination via endocrine hormones and the immune system; long range signal propagation in neurons. Interaction of living organisms with electric and magnetic fields.

Assessment: Class record (25%), Assignment – essay (25%), 2-hour theory examination (50%)

Will not be offered in 2004

BIOL3P2 - Applied Plant Physiology

(DSB3EH2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Biol 2E2

Content: The module covers advanced concepts in ecophysiology, the applied nature of the material being highlighted. It uses stress physiology as an integrating theme and explores the application of the concepts developed here to the applied fields of ecology and agriculture. The biochemistry underlying some physiological responses will be explored. The underlying theory and practice of modern techniques are covered.

Assessment: Class record (50%), 3-hour written examination (50%).

BIOL3Q2 - Aquatic Ecosystems

(DSB3EJ2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 48 credits at Level II from modules in Biological or Environmental Sciences

Content: Inland waters of southern Africa – distribution and major features. Conditions in rivers from source to estuary. Effects of dams. Estuarine environments – mouth dynamics, salinity gradients, temperature, turbidity, sediments. The estuarine biota. Estuarine productivity. Southern African inshore marine environments and the links with the fauna and flora. Introduction to fisheries biology.

Assessment: Class record (40%), 2-hour written examination (60%).

BIOL3RB - Research Project

(DSB3BA1) (0L-0T-69P-0S-85H-0R-0F-6A-13W-16C)

Prerequisite: 48 credit points at level II from modules in Biological Sciences

Content: Conception, designing, undertaking and reporting of a small independent research project

Assessment: A written project motivation (10%), assessment of general demeanour and commitment to the project (15%), and a formal project report (75%).

Note: This module may be done in either semester, but credit may only be obtained once.

BIOL3S1 - Seeds & Plant Propagation

(DSB3CF1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: 48 Credits at level II from modules in Biological Sciences

Content: Sexual propagation: basic seed structure, seed development; role of plant growth regulators. Water in seeds; desiccation. Vegetative propagation: macropropagation, *in vitro* micropropagation. Processes of organogenesis and embryogenesis *in vitro*, anther, ovule and endosperm culture, cell suspension cultures, protoplasts. Applications to agriculture, forestry and conservation. Germplasm conservation: principles of storage of orthodox and recalcitrant material.

Assessment: Class mark (50%), 3-hour written examination (50%)

BIOL3T2 - Principles of Biotechnology

(DSB3PB2) (14L-18T-0P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Biol 2M2

Content: Ancient, classical and modern biotechnology. Classical studies on cloning. Basic principles of recombinant DNA technology. Gene transfer methods in animals and plants. Topics in microbial, plant and animal biotechnology. Biotechnology and forensics. Regulations, patents and society.

Assessment: Class record (50%), 2-hour written examination (50%)

BIOL3U1 - Intro to Pollution Biology

(DSB3EK1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: 48 credit points at level II from modules in Biological or Environmental Sciences.

Content: The theory and practice of the assessment of the biological impacts of pollution of the air, soil and water. It considers the fate, exposure and effects of the main environmental chemicals and energy at different ecological scales: on individual organisms; their populations and communities; and on ecosystems as a whole.

Assessment: Class record (50%), 2-hour written examination (50%).

BIOL3V1 - Parasitism, Public Health & Evolution

(DSB3EN1) (14L-18T-0P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 48 credits at Level II in Biological and/or Biomedical and/or Environmental Sciences

Content: This module examines the ways in which parasites influence the lives and behaviour of their hosts; the origins of the parasites of *Homo sapiens* and evidence for parasitic disease in antiquity. Emphasis is given to those parasites that are of public health importance, the need for control programmes, and complicating issues such as human migration, water resource developments, drug and insecticide resistance.

Assessment: Class record (40%), assignment (20%), 2-hour written examination (40%)

BIOL3Y2 - Systematics & Evolution

(DSB3BE2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Biol 1D2, and at least 48 credit points at level II from modules in Biological Sciences

Content: Classification systems. The fundamental unit of evolution: species concepts. Speciation theory: natural selection, gradualism, neutralism, modes of speciation. Numerical taxonomy and phenetic analysis, cladistic analysis, tree construction Measurements of genetic diversity: morphometrics, geometric morphometrics, chromosomal evolution, allozyme variation and other methods that detect gene products, DNA variation. Practical applications.

Assessment: Class record (50%), 3-hour written examination (50%).

BIOL7A3 - Bioprocesses Engineering

(DSB7BPM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Review of biochemical and microbiological principles, applied to treatment of biological and chemical wastes. Biochemical reaction engineering: reaction kinetics, fermenter design, biochemical system parameters, batch and continuous fermentations. Industrial fermentation technology: agitation, aeration, sterilisation, filtration and product separation, examples of industrial processes. Immoblised enzyme systems. Pollution of water resources and amelioration thereof by application of bioprocesses.

Assessment: Coursework (50%), written examination (50%)

BIOL7B3 - Advanced Topics in Behavioural Ecology

(DSB7BEM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: The specific number of topics depends on the number of students taking the course. Topics are drawn from the following (non-exclusive) range, and are chosen by students to meet their specific interests: sexual selection, infanticide, begging, mating systems, brood parasitism, cooperative behaviour, sociality, influence of predation, foraging behaviour.

Assessment: Coursework (100%)

BIOL7C3 - Functional Cell Biology

(DSB7FCM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: A selection of the following major themes: membrane biogenesis, including specific MrnA transcription and co-translational protein insertion; membrane protein modification and distribution (ER and Golgi complex); cell surface, exo- and endocytosis; trans-membrane transport; cyto- and nucleoskeletons; pivotal role of calcium in intracellular processes; intracellular molecular control and experimental manipulation.

Assessment: Continuous assessment (100%)

BIOL7D3 - Plant & Animal Responses to Disease

(DSB7RDM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Genetic basis of health and disease. Common themes in plants and animals: xuperoxide bursts, signalling cascades, programmed cell death. Plant-specific case studies: wall chemistry; chemical signals; phyto-alexin synthesis; elicitors. Animal-specific case studies: inflammatory response to infection and injury (asthma, rheumatoid arthritis); endocrine hormones as metabolic co-ordinators, results of disruption in disease (diabetes mellitus); oncogenes and signal transduction (cancer); infection and failure of the immune response (HIV/AIDS)

Assessment: Coursework (60%), Examination (40%)

BIOL7F3 - Fisheries Science

(DSB7FSM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Introduction to fisheries science and sustainable utilisation of South African marine resources. Fisheries science theory and the practical use of fisheries models. Discussion topics include pelagic, dermersal, linefish, rock lobster and subsistence fisheries.

Assessment: Coursework (66%), Examination (33%)

BIOL7I3 – Internship

(DSB7INM) (0L-0T-0P-0S-0H-0R-140F-20A-7W-16C)

Content: A 6-7 week work experience placement (WEP): to gain practical experience in a working environment; and to undertake a research project in collaboration with a WEP and a university supervisor

Assessment: Written research report (70%), other assessments including log book, supervisors reports, project scoping and proposal documents (30%)

BIOL7M3 - Current Topics in Molecular Biology

(DSB7MBM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Recombinant DNA in medicine and industry; generation of agriculturally-important plants and animals; mapping and cloning human disease genes; DNA-based diagnosis of genetic diseases; working towards human gene therapy; molecular biology and ethics.

Assessment: Examination (60%) Assessment task (40%),

BIOL7O3 - Molecular Systematics & Cytotaxonomy

(DSB7MSM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Classification systems. Biological, recognition, phylogenetic concepts of species; speciation theory; numerical taxonomy and phenetic analysis, cladistic analysis, tree construction methods; morphometrics, geometric morphometrics, chromosomal evolution, allozyme variation and other methods that detect gene products, DNA variation in: "Managed species" of mammals, Marine mammals, or any other zoological research work of relevance to speciation theory.

Assessment: Coursework (50%), Examination (50%)

BIOL7P3 - Applied Plant Physiology

(DSB7PPM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: This module illustrates the importance of whole plant physiology to an understanding of the growth and performance of plants in natural and managed ecosystems, and trains students in modern approaches and techniques of plant physiology and their use in understanding vegetation processes.

Assessment: Coursework (40%), Examination (60%)

BIOL7PY - Research Project

(DSB7P11) (0L-0T-0P-0S-480H-0R-0F-0A-26W-48C)

Content: An independent research project which requires the student to collect, analyse, and evaluate data; integrate practical and theoretical skills; develop independent and critical thought; and communicate effectively in the form of a written and oral reports.

Assessment: Assessment reports (100%)

Note: Students must register for two semesters for this module

BIOL7R3 - Parasitology

(DSB7PSM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: There are two components. A theoretical component examines the dynamics of parasite transmission, taking into account the many events that make up this process. The practical component explores the use of Geographical Information Systems to identify biotic and abiotic variables that determine the distribution and severity of parasite transmission.

Assessment: Coursework (100%)

BIOL7R5 - Resource Modelling

(DSB7RMM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: What are natural resources. Inventory of natural resources. Quantifying natural resource use. Quantifying resource dynamics. Different kinds of resource use models. Rules for constructing resource models. The testing and evaluation of predictive models. The utility of models for developing theory. The use of theory in the management of resources. Models and Adaptive Environmental Management. Introduction to programming using Microsoft Visual Basic.

Assessment: Candidates will be required to construct a resource-use model of the candidate's choice using Microsoft Excel and Visual Basic. The models must be presented in the form of a report which covers all of the aspects outlined above.
Continuous assessment

BIOL7RY - Research Skills & Attitudes

(DSB7R11) (0L-52T-0P-8S-70H-0R-0F-30A-26W-16C)

Content: Philosophy of science; ethics; professional attitudes, expectations, and behaviour. Project selection, design, and implementation. Time management. General analytical and interpretative skills. Literature review and information access. Critical assessment of the primary literature. Proposal writing. Oral and written communication skills.

Assessment: Coursework (100%)

Note: Students must register for two semesters for this module

BIOL7S3 - Seed Biology

(DSB7SBM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Developmental control and acquisition of desiccation tolerance ('orthodox' seeds); degrees of desiccation sensitivity and responses to other stresses ('non-orthodox' seeds); progression to contemporary understanding of recalcitrant seed biology; post-harvest physiology of orthodox and recalcitrant seeds; biotechnological approaches to germplasm conservation of species producing non-orthodox seeds; principles and practices of cryostorage.

Assessment: Continuous assessment (100%)

BIOL7T3 - Plant Biotechnology

(DSB7PBM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: The module focuses on the use of plant biotechnology and management approaches to supplement conventional practices in the conservation of plant genetic resources, agricultural, forestry, food and pharmaceutical industries. Also considered are public perceptions of plant biotechnology, risk assessment, safety guidelines for recombinant DNA work and patents.

Assessment: Coursework (60%), Examination (40%)

BIOL7V3 - Marine Biodiversity

(DSB7MDM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: Species and ecosystem diversity. Diversity and biogeography of marine organisms, with emphasis on Southern Africa. Detailed analysis of special ecosystems, such as hydrothermal vents, polar seas, coral reefs etc. International Convention on Biological Diversity.

Assessment: Coursework (50%), Examination (50%)

BIOL7Y3 - Systems Ecology

(DSB7SEM) (0L-30T-0P-0S-100H-0R-0F-30A-7W-16C)

Content: The functioning of ecological systems. Techniques for the analysis of complex systems and for the detection of different order processes. Scaling effects and fractal structures in systems analysis. Assembly rules in community ecology.

Assessment: Coursework (50%), Examination (50%)

BIOL8D9 - Research Dissertation

(DSB8DIM) (0L-0T-0P-0S-640H-0R-0F-0A-13W-64C)

Content: Independent research dissertation on suitable topic

Assessment: Written report (100%)

BIOL8E3 - Coastal Ecology

(DSB8CEM) (6L-18T-36P-8S-86H-0R-0F-6A-7W-16C)

Content: The nature of the coastal aquatic environment of KZN including sea, estuaries and coastal lakes; adaptations shown by selected species to these habitats, comparison of the structure and functioning of the communities found in these habitats; coastal management

Assessment: Coursework (50%), Examination (50%)

BIOL8X3 - Ecotoxicology

(DSB8EXM) (14L-28T-0P-0S-106H-0R-0F-12A-7W-16C)

Content: Theory and practice of ecotoxicology through the critical evaluation of pollution pathways and direct and indirect effects at different ecological scales in terrestrial and aquatic ecosystems; ecological hazard and risk assessment of environmental chemicals and energy.

Assessment: Coursework (100%)

ECON4 - Principles of Environmental Economics

(DEC8PE2) (52L-52T-0P-0S-50H-0R-0F-6A-13W-16C)

Content: Provides an advanced understanding of the application of economic theory to environmental issues, with particular reference to the economics of cost-benefit analysis in environmental impact assessment.

GEOL7C3 - Coastal & Marine Geology

(DSG7CMM) (39L-0T-52P-0S-63H-0R-0F-6A-7W-16C)

Content: Earth processes: continental drift and plate tectonics, physiography and gross geology of continental margins. Marine geology of southern Africa: ocean currents, sediment types, rock types, sea level change. Coastlines: classification and processes, wind, tides, waves, sediment budgets, coastal lakes and estuaries, pollution. Marine survey tools: GPS, bathymetry, side-scan sonar, seismic.

Assessment: Coursework (33%), Examination (67%)

GEOL7P3 - Pollution Studies

(DSG7PSM) (39L-9T-39P-0S-67H-0R-0F-6A-13W-16C)

Prerequisite: 16 credits in Chemistry (DSC1CF1) or its equivalent

Content: Geochemical control on the inorganic chemical composition of natural waters. Water related problems in South Africa.

Assessment: 1x 3-hour written examination (67%), Class record (33%)

LAW8 - Ocean & Coastal Law

(DLA8OLM) (26L-13T-12P-4S-99H-0R-0F-6A-13W-16C)

Content: Seashore and coastal zone protection; coastal wetlands; marine reserves: territorial waters; marine pollution.

Assessment: Coursework (40%), Examination (60%)

Chemistry

Offered in the School of Pure and Applied Chemistry

CHEM1B1 - Augmented Chemistry 1

(DSC1FB1) (72L-16T-72P-0S-0H-0R-0F-0A-13W-16C)

Prerequisite:

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Chem 1F1 but, in addition, includes a substantial amount of supplementary material and tuition designed for students who are under-prepared for university-level studies.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM1B2 - Augmented Chemistry 2

(DSC1FB2) (72L-16T-72P-0S-0H-0R-0F-0A-13W-16C)

Prerequisite: Chem 1B1 or equivalent.

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Chem 1F2 but, in addition, includes a substantial amount of supplementary material and tuition designed for students who are under-prepared for university-level studies

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM1F1 - Fundamental Chemistry 1

(DSC1CF1) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Atomic structure and periodicity. Chemical bonding and molecular shape. Chemical reactions and molar stoichiometry. Diversity of carbon compounds, nomenclature and functional groups. Structures, isomerism, properties, and typical chemical reactivity of the major classes of organic compounds. Polymer chemistry. Gaseous state, intermolecular forces, and phase equilibria. Colligative properties.

Thermochemistry. Chemical equilibrium.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM1F2 - Fundamental Chemistry 2

(DSC1CF2) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1

Content: Acid-base equilibria, pH and buffers, solubility products, kinetics, entropy and Gibbs energy, and electrochemistry.

Conformation, configuration, structural isomerism and stereochemistry of aliphatic organic compounds. Valence Bond theory. Mechanism of functional group reactions.

Redox reactions, activity series and metallurgy. Systematic chemistry of selective groups of the Periodic Table. Hydrogen and hydrogen bonds.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM1G2 - General Chemistry

(DSC1CG2) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1

Content: Acid-based equilibria, pH and buffers, solubility products, kinetics, entropy and Gibbs energy, and electrochemistry.

Conformation, configuration, structural isomerism and stereochemistry of aliphatic organic compounds. Valence Bond theory. Functional group reactions and mechanisms.

Bio-inorganic chemistry.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

Note: This modules is designed for students who do not plan to continue in Chemistry but require 32 credits in level-1 Chemistry modules for their chosen programme of study (e.g. Biological Sciences, Biomedical Sciences, Environmental Sciences). Students with credit for Chem 1G2 may proceed to level-2 Applied Chemistry modules, but permission to proceed to any level-2 Chemistry modules is at the discretion of the Head of School.

CHEM2A1 - Inter. Analytical Chem

(DSC2CA1) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed)

Content: This module is an introduction to the theory and practice of analytical chemistry. It serves as a foundation for other analytical courses offered in the School of Pure and Applied Chemistry. Fundamental concepts of analytical chemistry. Introduction to sampling methods and sample preparation. Gravimetric and titrimetric analysis. Chemical equilibria.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2C2 - Construction Materials

(DSC2AC2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1 and 1F2 or 1G2

Content: This module is designed to give an understanding of materials used for construction – their production, composition and properties and the methods used for their protection and preservation: Metals. Cement and concrete. Structural clay products (bricks, tiles, etc). Glass. Wood and wood products. Polymers. Surface coatings. Corrosion and corrosion prevention. Weathering, degradation and preservation.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2D1 - Industrial Chem

(DSC2AI1) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 or 1G2.

Content: This module is designed as an introduction to the Chemical industry: Raw materials. Separation techniques. Heat transfer and fuels. Inorganic chemical industries – soda ash, the chloralkali industry, sulphuric acid, ammonia, nitric acid, phosphoric acid and phosphates, chemicals from coal.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2E1 - Environmental Chem

(DSC2AV1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1 and 1F2 or 1G2.

Content: This module is designed to create an awareness of environmental problems, to gain an overview of natural processes and relevant control measures and to provide a foundation for solving man-made environmental problems: Atmospheric chemistry and pollutants. Treatment of water for domestic consumption. Industrial effluent management and sewage treatment processes. Solid waste management. Chronic and acute toxicity.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2I2 - Inter. Inorganic Chem

(DSC2CI2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed)

Content: This module is an introduction to modern inorganic chemistry in which there is a broad coverage of the reactions of elements and their compounds considered in relation to elementary principles: the Chemistry of the main group transition elements. Preparation of compounds of common elements.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2L1 - Inter. Instrumental Analysis

(DSC2CL1) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed)

Content: This module serves as an introduction to instrumental analysis: Equilibrium electrochemistry. Potentiometric methods of analysis. Conductivity and conductometric methods of analysis. Introduction to spectroscopic methods. The electromagnetic spectrum and characteristic atomic and molecular activities associated with each region. The emphasis will be on ultraviolet/visible spectroscopy.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous

assessment (30% of final mark).

CHEM2M1 - Chem of the Mining Industry

(DSC2AM1) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 or 1G2.

Content: This module provides an integrated overview of the chemistry of metals and the mining industry: Chemistry of metals important to the South African mining industry. Extraction processes. Environmental issues of mining.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2O2 - Inter. Organic Chem

(DSC2CO2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed)

Content: This module covers the chemistry of aliphatic and aromatic compounds: Chemistry of the carbonyl group. Aromaticity. Aromatic substitution and substituent interconversion.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2P1 - Inter. Physical Chem

(DSC2CP1) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed) and either Math 1S1 and 1S2, or Math 1G1 and 1G2.

Content: This module covers the basic concepts of physical chemistry in an elementary way (a knowledge of calculus is assumed and the solution of numerical problems is an important aspect). Properties of gases. Chemical thermodynamics. Chemical equilibrium. Rates of chemical reactions.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2S2 - Structure & Mechanism

(DSC2CS2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 (pass-proceed)

Content: This module covers concepts of chemical bonding and their relation to reactivity: Structures and bonding of simple covalent and ionic compounds. Concepts of stereochemistry. Bond formation and bond breaking in chemical reactions will be described by studying a range of reaction mechanisms. Relationships among structure, stereochemistry and kinetics will be demonstrated.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM2W2 - Wood and Sugar Industry

(DSC2AW2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 1F1 and 1F2 or 1G2

Content: This module is designed to introduce various chemical processes through their use in the wood and sugar industries. Wood Industry - basic wood chemistry, pulping processes, bleaching and by-products.

Sugar Industry - cane preparation and extraction, extract clarification, evaporation and sugar boiling, sugar crystallisation, centrifugation, drying, refining and by-products.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3C1 - Chemical Process Technology

(DNC3CP1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 2D1, 2P1, 2A1 and 2L1.

Content: This module is given by the School of Chemical Engineering. The aim of the module is to provide level III science students who intend following a career in industry with a basic understanding of the engineering topics that they are likely to encounter in an industrial environment. It is primarily intended for level III Applied Chemistry students and is a compulsory module towards their degree. The module covers: Unit operations, instrumentation, P & I diagrams, mass and energy balances, basic heat transfer calculations, mass transfer, pumps, reactors, stirrers and mixing.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3I1 - Inorganic Chemistry

(DSC3IN1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 2L1, 2I2 and 2S2

Content: This module follows Chem 2I2 and Chem 2S2. It is for graduating students and the coverage of chemical bonding is at a higher level. The emphasis is on transition metal chemistry. It covers structure and bonding in compounds of transition elements; chemistry of transition elements, reaction mechanisms, preparative techniques and characterization of compounds.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3L2 - Instrumental Analysis

(DSC3IA2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 2A1, 2P1, 2L1, 2I2, 2O2, and the Physics modules Phys 1S1 and 1S2

Content: Utilizing the foundation laid down by Chem 2A1 and Chem 2L1, this module focuses on qualitative and quantitative analysis using modern analytical instrumentation. Emphasis is placed both on the use of molecular spectroscopy for the determination of molecular structure and on instrumental principles and methods for the quantitative analysis of molecular, atomic and ionic species. The module covers atomic emission and absorption spectroscopy; fluorescence; X-rays; chromatographic methods; nuclear magnetic resonance; infrared, Raman and ultraviolet/visible spectroscopy; mass spectrometry and hyphenated techniques.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3O1 - Organic Chemistry

(DSC3OR1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 2L1, 2O2 and 2S2

Content: This module is for graduating students and follows Chem 2O2 and Chem 2S2, extending the coverage to heterocyclic and alicyclic compounds, methods of synthesis and degradation, stereochemistry and a further study of reaction mechanisms. It covers nomenclature, properties, reactions and syntheses of heterocyclic compounds; synthesis of carbocyclic compounds from acyclic, cyclic and aromatic precursors; chemistry of proteins, nucleic acids and sugars.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3P2 - Physical Chemistry

(DSC3PH2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 2P1, 2L1 and the Physics modules Phys 1S1, and 1S2

Content: In this module the principles established in Chem 2P1 and 2L1 are used to develop some important applications of physical chemistry. The module covers rotational, vibrational and electronic spectroscopy; kinetics of complex reactions; chain reactions; photochemical reactions; molecular reaction dynamics; changes of state; phase diagrams; phase rule; thermodynamics of mixtures and properties of surfaces.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3R2 - Integrated Project

(DSC3PJ2) (20L-0T-54P-0S-77H-0R-0F-9A-13W-16C)

Prerequisite: 96 credit points in level II modules required for the programme of Pure and Applied Chemistry

Corequisite: Chem 3L2

Content: This module builds on elementary experimental techniques and focuses on experimental chemistry as a whole rather than as isolated segments of laboratory work. It is intended that students learn to carry out independent research/study. Sampling strategy. Practical methodology. Research techniques. Record keeping. Writing laboratory reports. Library practice and data sources. Use of spreadsheets in chemistry. Mini-projects.

Assessment: Continuous assessment of laboratory work, written project reports, and seminar (80%); class tests and assignments (20%).

CHEM3T1 - Technical Management

(DSC3TM1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1 and 1F2 or 1G2, and a minimum of 96 level II credits in modules from lists A or B of rule SD6.

Content: This module will provide scientists who intend following a career in industry with an appreciation of the commercial world and of some of the basic technical management skills required. It covers: General business appreciation, professional laboratory practice, product development, project management and some accounting principles.

Assessment: One 3-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3X2 - Catalysis

(DSC3CT2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 3I1, 2L1

Corequisite: Chem 3P2, 3IA2

Content: This module is designed to give an overview of catalysis and to understand the basic principles behind the topic. The course includes major catalytic processes (mainly industrial), mechanisms and catalyst characterisation.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM3Y2 - Polymers

(DSC3PY2) (14L-0T-18P-0S-44H-0R-0F-4A-13W-8C)

Prerequisite: Chem 2O2, 2S2, 2L1

Content: This module is designed as an introduction to synthetic polymers and their raw materials. It

covers: Introduction to petrochemicals, monomers, mechanisms of polymerization and copolymerization, chemical modifications, molecular architecture, chemical, physical and mechanical properties of polymers and their control and modification. Polyolefins, polystyrene and copolymers, PVC and plasticizers, polydienes, polyesters, polyamides, epoxies. Polyurethanes, rubbers, fibres.

Assessment: One 2-hour written examination (70% of final mark); class record based on continuous assessment (30% of final mark).

CHEM7A1 - Analytical Chemistry (core)

(DSC7AC1) (23L-0T-45P-0S-86H-0R-0F-6A-13W-16C)

Content: Analysis and Inductively Coupled Plasma-Mass Spectrometry: Advanced aspects of inductively coupled plasma-mass spectrometry. Sample preparation. *Advanced Nuclear Magnetic Resonance Spectroscopy:* Structural elucidation using two-dimensional NMR techniques. *Chromatographic Techniques:* Chromatographic separation and measurement methods. Theoretical and practical applications. Hyphenated techniques.

Assessment: 1x 3-hour examination (80%), practical assessment (20%)

CHEM7A2 - Analytical Chemistry electives

(DSC7AC2) (30L-0T-0P-0S-124H-0R-0F-6A-13W-16C)

Content: A range of topics in analytical chemistry not included in the core module Chem 7A1, or amplification of aspects in that module are available for selection. Examples of the type of subjects offered are waste disposal and environmental analysis.

Assessment: 1x 3-hour examination (100%)

CHEM7A4 - Special Analytical Chemistry Electives

(DSC7CA2) (15L-0T-0P-0S-61H-0R-0F-4A-6W-8C)

Content: Special Topics.

Select 8C from the range of topics listed under Chem 7A2 (students may not register concurrently for Chem 7A2 and Chem 7A4)

Assessment: 1x 90-minute examination (100%)

CHEM7I1 - Inorganic Chemistry (core)

(DSC7IC1) (23L-0T-45P-0S-86H-0R-0F-6A-13W-16C)

Content: Interfacial Electrochemistry: Electrodics, instrumentation and techniques, potential step methods, voltammetry, rotating electrodes, applications. *Inorganic and Organotransition Metal Chemistry:* Preparation and reactions of transition metal carbonyl, alkyl, carbene and carbyne compounds. Characterization techniques (IR and NMR). Applications. *Bioinorganic Cellular Chemistry:* Transmembrane conduction of inorganic ions; review of current model systems designed to elucidate mechanisms of transport.

Assessment: 1x 3-hour examination (80%), practical examination (20%)

CHEM7I2 - Inorganic Chemistry electives

(DSC7IC2) (30L-0T-0P-0S-124H-0R-0F-6A-13W-16C)

Content: A range of topics in inorganic chemistry not included in the core module Chem 7I1, or amplification of aspects in that module are available for selection. Examples of the type of subjects offered are bioinorganic chemistry, radio chemistry, catalysis and supramolecular chemistry.

Assessment: 1x 3-hour examination (100%)

CHEM7I4 - Special Inorganic Chemistry Electives

(DSC7CI2) (15L-0T-0P-0S-61H-0R-0F-4A-6W-8C)

Content: Special Topics.
Select 8C from the range of topics listed under Chem 7I2 (students may not register concurrently for Chem 7I2 and Chem 7I4)

Assessment: 1x 90-minute examination (100%)

CHEM7O1 - Organic Chemistry (core)

(DSC7OC1) (23L-0T-45P-0S-86H-0R-0F-6A-13W-16C)

Content: Frontier Molecular Orbital Theory: A discussion of frontier molecular orbital symmetry in electrocyclic, cycloaddition and sigmatropic rearrangement reactions. *Advanced Reaction Mechanisms:* Frontier molecular orbital theory and effects on reaction rates and substrate stability, hard and soft acids and bases, factors affecting reaction mechanisms. *Asymmetric Synthesis:* Chirality and stereochemistry, analytical methods, determination of enantiomeric purity; asymmetric synthesis. Retrosynthesis : The retrosynthetic approach to designing syntheses of organic molecules.

Assessment: 1x 3-hour examination (80%), practical assessment (20%)

CHEM7O2 - Organic Chemistry electives

(DSC7OC2) (30L-0T-0P-0S-124H-0R-0F-6A-13W-16C)

Content: A range of topics in organic chemistry, not included in the core module Chem 7O1, or amplification of aspects in that module are available for selection. Examples of the type of subjects offered are medicinal chemistry, solid phase peptide synthesis and synthesis and biosynthesis of natural products.

Assessment: 1x 3-hour examination (100%)

CHEM7O4 - Special Organic Chemistry Electives

(DSC7CO2) (15L-0T-0P-0S-61H-0R-0F-4A-6W-8C)

Content: Special Topics.
Select 8C from the range of topics listed under Chem 7O2 (students may not register concurrently for Chem 7O2 and Chem 7O4)

Assessment: 1x 90-minute examination (100%)

CHEM7P1 - Physical Chemistry (core)

(DSC7PC1) (23L-0T-45P-0S-86H-0R-0F-6A-13W-16C)

Content: Molecular Symmetry: Symmetry elements and symmetry operations. Point groups, Schoenflies notation, character tables; vibrational spectroscopy; atomic and molecular orbitals. *Photochemistry:* Basic concepts, principles of absorption and emission of radiation, experimental techniques, applications. *Chemical Thermodynamics:* Chemical potential, extensive properties and partial molar properties; the equilibrium constant; ideal and non-ideal solutions, activity coefficients, solubility and the equilibrium constant, applications.

Assessment: 1x 3-hour examination (80%), practical assessment (20%)

CHEM7P2 - Physical Chemistry Electives

(DSC7PC2) (30L-0T-0P-0S-124H-0R-0F-6A-13W-16C)

Content: A range of topics in physical chemistry, not included in the core module Chem 7P1, or amplification of aspects in that module are available for selection. Examples of the type of subjects offered are molecular spectroscopy, statistical thermodynamics, photochemistry of nucleic acid bases and solution chemistry.

Assessment: 1x 3-hour examination (100%)

CHEM7P4 - Special Physical Chemistry Electives
(DSC7CP2) (15L-0T-0P-0S-61H-0R-0F-4A-6W-8C)
Content: Special Topics.
Select 8C from the range of topics listed under Chem 7P2 (students may not register concurrently for Chem 7P2 and Chem 7P4)
Assessment: 1x 90-minute examination (100%)

CHEM7R2 - Honours Project
(DSC7PR2) (0L-0T-0P-0S-313H-0R-0F-7A-13W-32C)
Content: Students will undertake a research project selected from a list proposed by members of staff. Topics will change from year to year.
Assessment: Project execution (10%) and written report (70%), oral presentation (20%)

Computer Science

Offered in the School of Geological and Computer Sciences

COLT1LB - Computer Literacy
(DSX1CL1/2) (39L-0T-36P-0S-79H-0R-0F-6A-13W-16C)
Prerequisite:
Content: Introduction to computers and operating systems; word processing; spreadsheets; Internet and the World Wide Web; computers in society.
Assessment: One 2-hour theory examination, contributing 50% to the final mark, the remainder being by continuous assessment.
Note: This module may be done in either semester, but credit may only be obtained once.

COMP1B1 - Augmented Computer Science 1XA
(DSX1AU1) (39L-18T-72P-0S-25H-0R-0F-6A-13W-16C)
Prerequisite:
Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Comp 1X1 and, in addition to this, a substantial amount of additional material designed for students who are under-prepared for university-level studies.
Assessment: One 2-hour theory, and one 3-hour practical examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP1B2 - Augmented Computer Science 1BA
(DSX1AU2) (39L-18T-72P-0S-25H-0R-0F-6A-13W-16C)
Prerequisite: Comp 1B1.
Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Comp 1S2 and, in addition to this, a substantial amount of additional material designed for students who are under-prepared for university-level studies.
Assessment: One 2-hour theory, and one 3-hour practical examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP1S1 - Computer Science 1A

(DSX1CS1) (39L-0T-36P-0S-79H-0R-0F-6A-13W-16C)

Prerequisite:

Content: Number representation, logic, Boolean algebra, simple programming in a high level language. Selected topics from computer science possibly including finite automata, cryptography, the Internet, spreadsheets.

Assessment: Two 2-hour theory examinations contributing 70% to the final mark, the remainder being by continuous assessment.

Note: This module is only available to students who have passed Computer Studies in their matriculation examinations (see Comp 1X1 below).

COMP1S2 - Computer Science 1B

(DSX1CS2) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Prerequisite: Comp 1S1, 1X1 or 1B1.

Content: Object oriented design, programming in a high level language, structured data types, sorting, searching, recursion, program testing. An overview of Computer Science and its component sub-disciplines.

Assessment: One 2-hour theory, and one 3-hour practical examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP1X1 - Computer Science 1X

(DSX1CX1) (39L-0T-36P-0S-79H-0R-0F-6A-13W-16C)

Prerequisite:

Content: Number representation, logic, Boolean algebra. Introduction to the computer, basic computer literacy, problem solving and algorithm design; simple programming in a high level language, program debugging and testing.

Assessment: One 2-hour theory, and one 3-hour practical examination contributing 70% to the final mark, the remainder being by continuous assessment.

*Note: This module is **not** available to students who have passed Computer Studies in the matriculation examinations (see Comp 1S1 above).*

COMP2C2 - Computer Organisation

(DSX2CO2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2O1

Content: Memory, logic and control units. Accumulator machines. Stack machines. Microprogramming. Assemblers. Assembly language programming. Introduction to advanced architectures.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP2D2 - Data Structures

(DSX2DA2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2O1

Content: Data abstraction and encapsulation. Specification and implementation of data structures. Linear structures, order and iterators. Trees. Binary search trees. Sets and dictionaries. Graphs. Introduction to algorithms and complexity.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP2O1 - Object-Oriented Programming
(DSX2OP1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Math 1S2, Comp 1S2(pass-proceed) or 1B2 (pass-proceed)

Content: Object oriented design: classes, inheritance and polymorphism. Design methodology and notation. Introduction to abstract data types. Container classes and iterators. Advanced programming constructs.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3A1 - Artificial Intelligence
(DSX3AI1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2

Content: Problem & knowledge representation, logic, search & heuristics, applications from game-playing, expert systems, neural networks, genetic algorithms, automatic theorem proving.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3C2 - Compilers & Interpreters
(DSX3CI2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2

Content: Compilers & interpreters, compiler design, parsing & lexicographic analysis, low-level languages, RISC, grammars, applications.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

Note: This module will not be offered in 2004

COMP3D2 - Database Systems
(DSX3DB2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2

Content: Database models, relational & object-oriented systems, database programming languages: SQL, QBE & JDBC; database architectures; client-server, distributed & parallel, applications.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3G1 - Graphics & Modelling
(DSX3GM1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2O1 and either Comp 2D2 or Math 2C2

Content: 3D modelling concepts, a modern 3D-modelling language, scripting, animation techniques.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3L1 - Comp. Programming Languages
(DSX3PL1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2

Content: Historical survey. Imperative languages. Types, objects and declarations, expressions and statements, subprograms, data structures, modules. Object-oriented programming. Generic programming. Functional languages. Declarative languages. Logic programming. SQL. Syntax and semantics. Current trends.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3N1 - Computer Networks

(DSX3CN1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2 or Comp 2C2

Content: The ISO model, data transmission fundamentals, LANs, routing, the transport layer, network security & management, protocol suites, TCP/IP, the Internet.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3O2 - Operating Systems

(DSX3OS2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2 or Comp 2C2

Content: Concurrent programming, synchronization, deadlock, scheduling, memory management, security, UNIX.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3P2 - Advanced Programming

(DSX3AP2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2D2 and Comp 3L1

Content: High-Level language programming, software engineering, major programming project, associated tools & techniques, advanced object-oriented programming, user interface design.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP3X2 - Algorithms & Complexity Theory

(DSX3AC2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2O1 and either Comp 2D2 or Math 2C2

Content: Algorithm design techniques, fundamental algorithms, graph algorithms, analysis of algorithms, P & NP, introduction to complexity theory, selected topics.

Assessment: One 3-hour theory examination contributing 70% to the final mark, the remainder being by continuous assessment.

COMP7A3 - Artificial Intelligence

(DSX7AIM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)

Content: In-depth coverage of one or more areas of artificial intelligence such as expert systems, game-playing, genetic algorithms, neural networks, automated theorem proving, natural language processing.

Assessment: Continuous assessment (100%)

COMP7C3 - Computer-Aided Learning & Multimedia

(DSX7CLM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)

Content: Principles of computer-aided learning, the effective use of multimedia, development of multimedia.

Assessment: Continuous assessment (100%)

COMP7D3 - Distributed Computing
(DSX7DCM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Prerequisite: DSX7AJM
Content: Distributed applications, 2- and 3-tier models, remote objects, RMI, CORBA, distributed databases, agents.
Assessment: Continuous assessment (100%)

COMP7G3 - Graphics in a Visual Environment
(DSX7GRM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Topics from computer graphics in a Windows visual environment.
Assessment: Continuous assessment (100%)

COMP7I3 - Image Processing
(DSX7IPM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Signal processing, transforms, morphology, edge-detection, projections, reconstruction.
Assessment: Continuous assessment (100%)

COMP7J3 - Advanced Java Programming
(DSX7AJM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Topics in advanced Java programming
Assessment: Continuous assessment (100%)

COMP7L3 - Intelligent Systems
(DSX7ISM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Principles of intelligent systems, techniques for developing intelligent hybrid systems e.g. neural networks, fuzzy-logic, genetic algorithms.
Assessment: Continuous assessment (100%)

COMP7M3 - Mathematical Modelling
(DSX7MMM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Use of the symbolic, numeric and graphical capabilities of the symbolic manipulation package, Mathematica; modelling problems.
Assessment: Continuous assessment (100%)

COMP7N3 - Cryptography & Network Security
(DSX7CRM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Topics from modern cryptography, including symmetric & public-key cryptosystems, digital signature schemes, information theory, principles of network security.
Assessment: Continuous assessment (100%)

COMP7O3 - Advanced Operating Systems
(DSX7AOM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Prerequisite: DSX3OS2, DSX3AP2
Content: Topics from:
Real time issues in multi-user operating systems
Distributed operating systems including cluster and grid computing
Assessment: Continuous assessment (100%)

COMP7P3 - Parallel Processing
(DSX7PPM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Concurrency, parallel machine models, architectures, workstation networks, languages, algorithms.
Assessment: Continuous assessment (100%)

COMP7P9 - Honours Project
(DSX7PRM) (0L-0T-0P-0S-320H-0R-0F-0A-13W-32C)
Content: Project topics from computer science.
Assessment: Oral presentation (10%), Project (90%)

COMP7R3 - Real Time Operating Systems
(DSX7RTM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Real time issues in multi-user operation systems.
Assessment: Continuous assessment (100%)

COMP7S3 - Systems Software & Hardware
(DSX7SSM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: In-depth coverage of topics drawn from one or more areas such as networks, operating systems, computer organisation.
Assessment: Continuous assessment (100%)

COMP7T3 - Special Topics A
(DSX7STM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Special Topics.
Assessment: Continuous assessment (100%)

COMP7T5 - Special Topics B
(DSX7SUM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Special Topics.
Assessment: Continuous assessment (100%)

COMP7X3 - Algorithms & Complexity
(DSX7ACM) (20L-0T-20P-0S-114H-0R-0F-6A-13W-16C)
Content: Topics from: string, geometric, number theoretic & graph algorithms; models of computers, computability theory, complexity classes, completeness.
Assessment: Continuous assessment (100%)

Economics

In the Faculty of Management Studies (Durban)

Economics 1A
(DEC1EC1) (39L-0T-0P-0S-75H-40R-0F-6A-13W-16C)
Prerequisite: Nil
Content: Introductory economic concepts including the principles of supply and demand, the efficient

production of goods, market structures under perfect competition and monopoly. The markets for labour, capital and land are analysed and the manner in which income and wealth is distributed.

Assessment: 1 essay (10%), 3 tests (30%), 1 three-hour examination (60%)

Economics 1B

(DEC1EC2) (39L-0T-0P-0S-75H-40R-0F-6A-13W-16C)

Prerequisite: Nil

Content: An introduction to macroeconomics. The operation of the money market is examined, and the main components of expenditure (consumption, investment, government spending and net exports) are used to build simple macroeconomic models. Fiscal and monetary policy tools and their ability to influence key macroeconomics concerns of inflation, unemployment and growth are assessed.

Assessment: 3 tests (40%), 1 three-hour examination (60%)

Economics 2A

(DEC2EC1) (38L-4T-0P-0S-62H-50R-0F-6A-13W-16C)

Prerequisite: Economics 1B

Content: Intermediate macroeconomics. Theories of income determination and employment are examined via analysis of goods and money markets and in an aggregate demand/aggregate supply framework. Fiscal and monetary policies and their impact on output, employment and prices are analysed, as are trade-offs between inflation and unemployment. Key macroeconomic issues are assessed in the context of developed and developing economies.

Assessment: 2 tests (33%), 1 three-hour examination (67%)

Economics 2B

(DEC2EC2) (39L-4T-0P-0S-61H-50R-0F-6A-13W-16C)

Prerequisite: Economics 1A

Content: Intermediate microeconomics. Consumer behaviour is analysed in terms of ordinal utility theory and revealed preference. Production and optimisation is examined. Firm behaviour in imperfectly competitive markets is examined in the context of South African industry. Efficiency implications are assessed. An introduction to welfare economics is provided.

Assessment: 2 tests (33%), 1 three-hour examination (67%)

Environmental Economics

(DEC3EE2) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2B

Content: This module addresses the nature and causes of modern environmental problems and the application of microeconomic analysis to these problems, with particular reference to natural resource depletion and pollution. Ecology and sustainable development are examined, while environmental issues in South Africa receive particular attention.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Special Topics

(DEC3SP2) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2A and 2B

Content: Topics of current interest from theoretical and policy perspectives may be offered.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Labour Economics

(DEC3LE2) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2B

Content: Key issues in the South African labour market are addressed, including wage determination, inequality and discrimination, affirmative action, unemployment, labour relations and globalisation. The module examines critically the tools that economists have used to analyse these issues and explores current policy initiatives and policy debates in the South African economy.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Economic Modelling

(DEC3EM1) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2A and 2B

Content: This module will cover the essential elements of the application of economic theory to real-world data using the tools of mathematics and econometrics at a basic level. A brief introduction to the necessary mathematical tools lays the foundation for the estimation and interpretation of single-equation models with continuous dependent variables. The emphasis will be on practical application rather than theory.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Macroeconomic Policy in South Africa

(DEC3SA2) (38L-4T-0P-0S-62H-50R-0F-6A-13W-16C)

Prerequisite: Economics 2A

Content: The theoretical foundations of macroeconomics are used to understand the objectives of and conflicts in macroeconomic policy. The module will examine monetary policy and the S.A. financial system, as well as fiscal and budgetary policy. Open-economy macroeconomic issues will be analysed, as will the co-ordination between monetary, fiscal and balance of payments policies.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Maritime Transport Economics

(DEC3ME1) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2B

Content: This module will examine the organisation of the sea transport industry and the major factors affecting its demand, supply, price and cost in the context of the extreme volatility that has characterised this dominant international transport mode in recent decades. Maritime transport policies and their impact on markets are a particular focus of attention. The module is set in the context of Southern Africa and the Indian Ocean Rim.

Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

International Economics

(DEC3IT1) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)

Prerequisite: Economics 2A and 2B

Content: The main focus of this module is on international trade theory and commercial policy, including tariff and non-tariff barriers. The module also includes a briefer coverage of international finance and exchange rate policy. Questions of economic integration are covered and a brief review of illegal international transactions is included.

Assessment: 4 assignments/tests (50%), 1 three-hour examination (50%)

Special Topics
(DEC3SP1) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)
Prerequisite: Economics 2A and 2B
Content: Topics of current interest from theoretical and policy perspectives may be offered.
Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Economics of Africa
(DEC3EA2) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)
Prerequisite: Economics 2A
Content: This module in applied economics introduces students to the analysis of crucial issues in development in all African regions. It focuses on both the causes of the present economic crisis and on comparative studies of strategies of development. The potential major players in economic co-operation with South Africa are discussed in detail.
Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Industrial Organisation
(DEC3IO1) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)
Prerequisite: Economics 2B
Content: This module studies the meaning, measurement and promotion of effective competition as it has been studied in the field of industrial organisation. This requires the study of competition and monopoly. The module therefore involves the concepts and analytical methods that clarify markets and assesses the data on markets. Market structure and competition policy as it is applied in South Africa forms the nucleus of this course.
Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Public Finance
(DEC3FI2) (30L-10T-0P-0S-76H-40R-0F-4A-13W-16C)
Prerequisite: Economics 2B
Content: This module examines the broad role of the state in modern mixed economies. It addresses the theory and effects of government expenditure, taxes and transfer payments. Both efficiency and equity considerations of the public sector budgets are assessed.
Assessment: 3 assignments/tests (40%), 1 three-hour examination (60%)

Engineering

In the Faculty of Engineering (Durban & Pietermaritzburg)

Geomatics 1
(DNS1GO1) (28L-10T-19P-0S-68H-30R-0F-5A-13W-16C)
Aim: To provide students with an ability to choose an appropriate data-gathering technology for a particular Geomatics based spatial information problem, and assess the quality of that data.
Content: An overview of the concepts of Geomatics; the nature and representation of spatial data; co-ordinate systems and map projection systems used in South Africa (WGS84, Gauss conformal); overview of the methods of acquiring spatial data; processing and analysis, representation and display of data;

introduction to statistical analysis, GIS, remote sensing imagery, aerial photographs and map interpretation.

Practicals: Field work on data acquisition and presentation.

Assessment: Assignments, one test, one 3-hour examination.

Geomatics 2

(DNS1GO2) (28L-10T-19P-0S-68H-30R-0F-5A-13W-16C)

Prerequisite: DNS1GO1 (recommended)

Aim: To provide students with an ability to plan and carry out basic surveying routines for simple mapping problems; the use of total stations, levels and navigational GPS receivers. Explain how GPS and GIS work together in data gathering and analysis.

Content: The principles of angle measurement, methods of position fixing and their computation; principles of triangulation, trilateration and traversing. The acquisition of spatial data; site and field surveying using electronic theodolites; simple introduction to the Global Positioning System (GPS); GPS for use in Geographic Information Systems (GIS).

Practicals: Field work on data acquisition and presentation.

Assessment: Assignments, one test, one 3-hour examination.

Environmental Management

(DNV4EM1) (20L-5T-0P-0S-35H-17R-0F-3A-13W-8C)

Aim: To introduce students to environmental management, and global and local environmental issues. Components of the environment (technical, financial, legal, ecological, aesthetic, maintenance (operational)) are presented and the impacts of the major issues on each developed and analysed.

Content: Ecosystem characteristics, structure and processes, responses to resource developments and engineering interventions. IEM, EIA, definitions, techniques, limitations and value in the policy, planning, design, implementation, operation and decommissioning stages.

Practicals: One project scoping report.

Assessment: One report, one test, one one-and-a-half hour examination.

Environmental Technology

(DNV4ET2) (20L-4T-17P-0S-26H-10R-0F-3A-13W-8C)

Aim: The module will introduce the students to the fundamentals of environmental engineering, especially with reference to pollution of water systems, waste waters treatment (municipal waste waters, landfill leachate and mine effluents) and solid waste management. It will provide an outlook in the design and management of potable and waste waters treatment/purification plants and solid waste disposal.

Content: Fundamentals of environmental engineering and waste management, characterisation of waste waters, pollution of water systems, basic design and management of potable and waste water treatment plants.

Practicals: Characterisation of polluting potentials of waste waters.

Assessment: One test, one 2hr exam.

Environmental Sciences

Offered in the School of Life and Environmental Sciences

ENVS1G2 - Environmental Geography

(DSE1EG2) (39L-10T-30P-0S-75H-0R-0F-6A-13W-16C)

Content: The human population; resource use and human impacts on the environment; effects of population growth; management of soil, water, biological and energy resources; ethics, politics, economics and the environment.

Assessment: One 3-hour written examination (67%), class record (33%)

ENVS2A2 - Environmental Auditing

(DSE2AU2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Envs 1G2

Content: Environmental auditing concepts; history of environmental auditing; current international trends – eco auditing, ISO 14000, American and Japanese perspectives, BS 7750. Methods, techniques and case studies. *There will be one 8-hour field visit.*

Assessment: One 2-hour written examination (67%), class record (33%).

Note: It is not possible to obtain credit for both this module and Envs 2W2 (below).

ENVS2M1 - Environmental Management

(DSE2MA1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Envs 1G2

Content: Environmental management concepts; economic perspectives; environmental politics and policy processes; case studies in environmental management.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVS2S1 - Environmental Assessment

(DSE2AS1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Envs 1G2 or permission of the Head of School.

Content: Overview of the process of environmental assessment, its role in development planning and its contribution to sustainable development; stages in the EIA process screening, scoping, assessing, mitigating, reporting, decision-making and monitoring; environmental assessment methods; public participation.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVS2W2 - Env Auditing & Welfare Econ

(DSE2WE2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Envs 1G2

Content: Environmental auditing concepts; history of environmental auditing; current international trends – eco-auditing, ISO 14000, American and Japanese perspectives, BS 7750; Introduction to microeconomics; efficiency in exchange and production; introduction to welfare economics; market failure; cost-benefit analysis.

Assessment: One 2-hour written examination (67%), class record (33%).

Note: It is not possible to obtain credit for both this module and Envs 2A2 (above)

ENVS3A1 - Atmospheric Science

(DSE3AS1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Envs 1G2 and at least 64 credit points at level II.

Content: This module provides an understanding of meteorological theory as it applies to the study of weather and climate over South Africa and to the study of air pollution. Topics include: thermodynamics, atmospheric stability, atmospheric pressure and hydrostatic equilibrium, radiative processes, motion, divergence and vorticity, mid-latitude and tropical weather disturbances, urban climate, sea/land breeze circulations, topographically-induced circulations.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVS3B1 - Biogeography

(DSE3BI1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 64 credit points at level II.

Content: The module provides an introduction to biogeography, outlines the ecological and historical setting of species distributions, considers the distributions of taxa in space and time, and applies biogeographic theory to conservation. There will be an emphasis throughout the module of examples and case studies from our region. Students are expected to participate in practicals and tutorials and to complete an assignment, all of which forms an integral part of the course.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVS3C2 - Soil Erosion & Conservation

(DSE3ER2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 64 credit points at level II.

Content: Economic aspects of soil erosion; infiltration and OLF generation, entrainment and transport of particles by splash, OLF and wind; subsurface erosion, empirical and physically based models of soil loss; erosion, hazard assessment; strategies and techniques of soil conservation. *Optional Fieldwork:* 4 days.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVS3G1 - GIS: Geog Info Systems

(DSE3GS1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Matriculation Mathematics with at least a C at standard grade or E at higher grade; or Colt 1L1 or 1L2; and either 64 credit points at Level II or 32 credit points in Geology and Environmental & Engineering Geology.

Content: This introductory module provides both education and training in the conceptual framework, techniques and application of GIS to social and environmental problem-solving. Topics include: history and development of GIS; data models (raster vs. vector); co-ordinates (geocoding and map projections); data sources; GPS; GIS applications; decision-making; introduction to a GIS software package; project.

Assessment: One 2-hour theory examination and one 2-hour practical examination (67%), class record (33%).

ENVS3P2 - Enviro Science Project

(DSE3RP2) (0L-0T-69P-0S-85H-0R-0F-6A-13W-16C)

Prerequisite: At least 64 credit points at level II, including all level II modules required for an Enviro Science major/programme

Content: Conception, design, undertaking and reporting of a small independent research project supervised by a member of staff.

Assessment: Project report (100%).

Finance

In the Faculty of Management Studies (Durban)

Information Systems & Technology 1B

(DAC1ST2) (39L-13T-19P-0S-51H-35R-0F-4A-13W-16C)

Prerequisite: A minimum mark of 40% for Information Systems & Technology 1A **OR** a minimum mark for Computer Science 1A and co-registration with Computer Science 1B

Content: The purpose of this module is to examine the implications of using information systems and technology in business. This module comprises organizational information systems, e-commerce & leading technologies, information systems development activities (including management of the systems development process and interpersonal & communication skills) and algorithmic design and the fundamentals of programming.

Assessment: 3 one-hour tests (45%), 1 two-hour examination (55%)

Information Systems & Technology 2A

(DAC2BS1) (39L-13T-20P-0S-41H-40R-0F-10A-13W-16C)

Prerequisite: Information Systems Technology 1A **and** 1B **or** Computer Science 1A **and** 1B

Content: The objective of this semester module is to provide the theoretical foundation and practical application of data management and programming in both procedural and non-procedural languages. The module comprises database modelling & design, the Structured Query Language (SQL), and program development using a fourth generation language.

Assessment: Assignment/theory test/practical test (40%), 1 two-hour examination (60%)

Information Systems & Technology 2B

(DAC2BS2) (52L-10T-10P-0S-35H-52R-0F-6A-13W-16C)

Prerequisite: Information Systems Technology 1A **and** 1B **or** Computer Science 1A **and** 1B **and** Information Systems Technology 1B

Content: This module provides comprehensive details on the theory and practice of Systems Analysis & Design and Systems Implementation. In addition, students are provided with an in-depth knowledge of data communications and networking requirements including networking and telecommunications technologies, hardware, and software. This module comprises Systems Analysis and Design, Systems Implementation, and Networks & Telecommunications.

Assessment: 3 tests (45%), 1 three-hour examination (55%)

Information Systems & Technology 3A

(DAC3ST1) (39L-10T-0P-0S-207H-60R-0F-4A-13W-32C)

Prerequisite: Information Systems & Technology 2A & 2B

Content: This module is designed to provide students with an in-depth knowledge of the current application of computers in the commercial environment, to enable them to be proficient at the specification of user requirements of business information & technology systems. The module comprises analysis, human computer interface, web design, project management, teams & interpersonal communications & the analysis & specification of a live system (major project)

Assessment: Major Project (40%), 1 three-hour examination (60%)

Information Systems & Technology 3B

(DAC3ST2) (39L-13T-0P-0S-204H-60R-0F-4A-13W-32C)

Prerequisite: Information Systems & Technology 2A & 2B

Content: This module is designed to provide students with an in-depth knowledge of the current

application of computers in the commercial environment, to enable them to be proficient at the design & implementation of business information & technology systems. The module comprises advanced programming, advanced software development, database management, security & the design and implementation of a live system (major project).

Assessment: Major Project (40%), 1 three-hour examination (60%)

Financial Reporting 1A

(DAC1FR1) (39L-8T-4P-0S-65H-40R-0F-4A-13W-16C)

Prerequisite: Nil

Content: This module provides an understanding of the meaning and dimensions of entrepreneurship, as well as a theoretical and practical knowledge of accounting principles and the role of accounting in business management. Topics include: the entrepreneurial process; strategy and entrepreneurship; encouraging intrapreneurism; succession in the entrepreneurial business; the theory of financial accounting; generally accepted accounting principles and practices; recording of financial transactions; and preparation of basic financial statements.

Assessment: 2 tests (30%), 1 three-hour examination (70%)

Financial Reporting 1B

(DAC1FR2) (39L-8T-4P-0S-65H-40R-0F-4A-13W-16C)

Prerequisite: Nil

Content: This module provides a theoretical and practical knowledge of managerial accounting and business finance, and develops the application thereof in terms of the major decisions facing the financial manager. Topics include: reporting and analysis of costs in an organisation; managerial accounting principles; cost-volume-profit analysis; costing systems and their application; the financial environment; the time value of money; risk and return; the financing decision; the dividend decision; and short-term working capital decisions.

Assessment: 2 tests (30%), 1 three-hour examination (70%)

Geography and Environmental Management

Offered in the School of Life and Environmental Sciences

ENVM2E1 - Introductory Ecology

(DSH2IE1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 64 credit points from modules at level I

Content: "Ecology is the study of the distribution and abundance of living organisms in space and time". This module aims to build a better understanding of this statement by looking at different levels of organization, from individual organisms, to populations, communities and finally the landscape. The module is designed for students who do not have a scientific background, but who want to know more about the subject of ecology.

Assessment: One 2-hour examination (67%), class record (33%)

Note: This module may not be taken by students taking Biological Sciences (ie. students in the Life Sciences stream of the Environmental Science programme, or with 48 credits in level-2 modules in Biological Sciences).

GEOG1U1 - Urban Environments

(DSH1UE1) (39L-7T-30P-0S-78H-0R-0F-6A-13W-16C)

Content: The relationship between cities and the environment; the process of globalization; developed and developing regions; global cities; the history and current planning of South African cities; sustainable development of cities globally and locally; urban management.

Assessment: One 3-hour examination (67%), class record (33%)

GEOG2D2 - Environ & Development in SA

(DSH2DE2) (29L-5T-18P-0S-102H-0R-0F-6A-13W-16C)

Prerequisite: Geog 1U1or Envs 1G2

Content: This module firstly examines the peculiarities of southern Africa's biophysical environment. The constraints to and opportunities for development presented by this environment during the pre colonial, colonial and post colonial periods is explored. It is an integrated module framed in both the natural and social sciences which employs a case study approach to interrogate the major challenges for achieving sustainable development in this region.

Assessment: One 3-hour written examination (67%), class record (33%).

GEOG2L2 - SA Landscapes in Transition

(DSH2LA2) (29L-5T-18P-0S-102H-0R-0F-6A-13W-16C)

Prerequisite: Geog 1U1 or Envs 1G2

Content: The concept of landscapes; cultural landscapes which explore the relationship between place and identity; rural landscapes; the current land reform programme; the role of planning in shaping landscapes; Spatial Development Initiatives.

Assessment: One 3-hour written examination (67%), class record (33%).

GEOG3L2 - Land Issues & Rural Develop

(DSH3RD2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least 64 credit points at level II.

Content: Processes of agrarian change in S.A. in the wider context of land management and property relations in the region are considered. Revisits the history of regional rural planning and the philosophies and effects of past interventionist policies. The contemporary S.A. agrarian question is debated and the current land reform programme examined in the light of experience elsewhere in the region. The focus is not only on state policy-makers but also on the responses and initiatives of rural communities.

Assessment: One 2-hour written examination (67%), class record (33%).

ENVM3P2 - Enviro Management Project

(DSH3MP2) (0L-0T-69P-0S-85H-0R-0F-6A-13W-16C)

Prerequisite: At least 64 credit points at level II, including all level II modules required for an Enviro Management major/programme

Content: Conception, design, undertaking and reporting of a small independent research project supervised by a member of staff.

Assessment: Project report (100%).

GEOG3P2 - Geog Research Project

(DSH3RP2) (0L-0T-69P-0S-85H-0R-0F-6A-13W-16C)

Prerequisite: At least 64 credit points at level II, including all level II modules required for an Geography major/programme

Content: Conception, design, undertaking and reporting of a small independent research project supervised by a member of staff.

Assessment: Project report (100%).

GEOG3S1 - Sustainable Cities

(DSH3SC1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: At least 64 credit points at level II

Content: Application of the theory of sustainable development to cities is considered by exploring the relationship between cities and environment. Environmental problems in developing cities are discussed with reference to form and design. Principles, tools and programmes for environmental management are investigated. Finally environmental planning in informal settlements is used as a case study to illustrate integration of environment into project planning and development.

Assessment: One 3-hour written examination (67%), class record (33%).

GEOG3T1 - Tourism Studies

(DSH3TO1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: At least64 credit points at level II.

Content: Tourism through history; theoretical perspectives; tourism development; case studies.

Assessment: One 2-hour written examination (67%), class record (33%).

GEOG7A3 - Air Pollution

(DSE7POM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Air pollution chemistry, air pollution meteorology, dispersion modelling, impact and abatement strategies.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG7B3 - Biogeomorphology

(DSE7BGM) (0L-0T-0P-0S-160H-0R-0F-0A-13W-16C)

Prerequisite: DSE3GS1 or GIS equivalent

Content: Influence of different categories of plant roots, bases, canopies and densities on the detachment, transport and deposition of sediment. Influence of different categories of animals and their associated activities on the detachment, transport and deposition of sediment. Potential effects on distribution and density of invasive alien plant species and geomorphic consequences of the Working for Water Programme. Potential effects on distribution and density of domestic stock and geomorphic consequences of the land reform and land care programmes. Potential effects on distribution and density of wildlife and geomorphic consequences of recent land use change trends. Biogeomorphic implications of three different global climatic change scenarios. Students are required to participate in a field excursion where some of these effects will be demonstrated.

Assessment: 1x3 hour examination (67%), Class record (33%)

GEOG7C3 - Concepts

(DSH7CCM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: A critical examination of the philosophical foundations of the discipline of geography and environmental science and the practices of environmental scientists; positivism, humanism, Marxism, post-modernism, postcolonialism, radical green approaches to the environment and their methodological implications.

Assessment: 1x 3-hour examination (67%), Class record (33%)

Note: This module is only available to students in the BScHons (Geography & Environmental Management) qualification.

GEOG7E3 - Environmental Education

(DSE7EDM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Environmental philosophy, methodology, contemporary environmental education, international perspectives, environmental education curriculum development, policies and messages in the media. Action research project.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG7I3 - Environmental Impact Assessment

(DSE7EAM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: The objective of this module is to provide students with experience in undertaking an environmental impact assessment of a real development or project. The focus will be on group work and there will be an opportunity to engage in all aspects of a project of this nature, including preparation of a project proposal, financial and time budgeting, project management, field work, preparation of an environmental impact assessment report, integrated environmental management procedures and public participation.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG7PY - Research Project

(DSE7P11) (39L-9T-36P-0S-229H-0R-0F-7A-26W-32C)

Content: Independent, guided research on an approved topic, which is to be presented in the form of a typed thesis.

Assessment: Project report (100%)

Note: Students must register for two semesters for this module

GEOG7R9 - Research Methods

(DSE7MEM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: This course explores both quantitative and qualitative methods of research within the discipline of geography. It focuses on research design, the relationship between theory and empirical work, sampling procedures, questionnaire and survey design, statistical analysis of data and qualitative methods of research.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG7S3 - Conservation & Society

(DSH7CSM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: This course investigates ideas about nature and its preservation, locating them historically and in the context of contemporary global environmental debates. Ideas about conservation in different cultures western, African etc. are contrasted. A focus of the course is relationships between communities and nature conservation authorities in South Africa.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG7T3 - Tourism

(DSH7TOM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Demand, supply and impacts of tourism; urban tourism; ecotourism; policy development and implementation.

Assessment: 1x 3-hour examination (67%), Class record (33%)

Note: This module is only available for students in the Master of Environmental Management qualification.

GEOG7V3 - Wetland Ecology & Management

(DSE7WLM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: The course will focus on inland wetlands. These will be described from an environmental point of view, including hydrology, biogeochemistry and ecosystem development. Different 'inland wetland ecosystem types will be described, and their conservation and management discussed. The course will involve weekly discussion meetings which will focus on specific topics. Students will be expected to participate in a class project which will highlight a topical issue, and which will involve a field trip.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8D3 - Sustainable Development

(DSE8SVM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: This course considers the theory of sustainable development and how it can be applied in real world contexts. It first focuses on the history and philosophy of environmentalism and the social constructions of nature and then considers debates around the concept of sustainability. The various components of sustainability; environmental economics; social and environmental justice; risk and vulnerability; public participation and sustainability indictors are studied in detail. Finally the course considers the programmes, policies, legislation and tools appropriate for sustainability in South Africa.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8D9 - Research Dissertation

(DSE8DIM) (0L-0T-0P-0S-640H-0R-0F-0A-13W-64C)

Content: Independent research dissertation on suitable topic

Assessment: Written report (100%)

GEOG8G3 - Geographic Information Systems

(DSE8IFM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Analysis of the types of spatially-related problems faced in the modern world, and in the southern African context in particular. Introduction to GIS as a technology that has been evolved for the capture, storage, processing and display of spatially related information, GIS and its social relevance as part of spatial decision support system SDSS. Case studies will be used to illustrate different aspects of the theory and will provide hands-on experience with a GIS package. A visit to a GIS facility plus a field trip will be included.

Assessment: 1x 3-hour examination (33%) of the final mark; (subminimum of 40%); Class mark (67%) by ongoing assessment

GEOG8I9 - Internship

(DSE8INM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: The purpose of this module is to gain practical experience in a working environment and to undertake a research project during placement in an external organisation.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8M3 - Dynamic Meteorology

(DSE8DMM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Atmospheric thermodynamics; hydrostatic equilibrium and parcel convention; atmospheric motion, vorticity and circulation, synoptic scale waves, cyclogenesis; quasi-geostrophic theory.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8O3 - Tools of Environmental Management

(DSE8EMM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Integrated Environmental Management (IEM) theory; environmental assessment; research methods and GIS skills.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8P3 - Identity, Place & Postcolonialism

(DSH8PPM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: This course is concerned with the history and geography of colonialism and subsequent "postcolonial" cultural formations. In particular, the focus is on the cultural politics of place creation in specific contexts. Recent work by Australian and Africanist scholars provides a comparative perspective from which local KwaZulu-Natal issues of place and identity can be viewed. Specific topics to be investigated include land claims and struggles over heritage in rural and urban places. An independent research component is integral to the course.

Assessment: 1x 3-hour examination (67%), Class record (33%)

Note: This module is only available to students in the BScHons (Geog & Environmental Management) qualification

GEOG8R3 - Resource Management

(DSE8RSM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Water, land and ecosystem management; air quality management; urban environmental management; costing environmental impacts and resource use; conflict resolution strategies; policy development; integrated catchment management.

Assessment: 1x 3-hour examination (67%), Class record (33%)

GEOG8R5 - Research Report

(DSE8RRM) (20L-0T-18P-0S-275H-0R-0F-7A-13W-32C)

Content: Independent research report on suitable topic

Assessment: Written report (100%)

GEOG8U3 - Urban Studies

(DSH8UDM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: The Urban Studies module is divided into two sections. The first deals with the range of international and local theoretical approaches to understanding urban processes and urbanisation. The latter part of the module deals with South African urban research, focussing on explanations of the more recent changes in urban processes and forms with the restructuring of the South African city. Urban policy frameworks at the national, regional and local level are examined.

Assessment: 1x 3-hour examination (67%), Class record (33%)

Note: This module is only available to student in the BScHons (Geography and Environmental Management) qualification.

GEOG8X3 - Remote Sensing

(DSE8REM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Physical basis of remotely sensed data; the UNESCO-BILKO system; BILKO remote sensing software; creating colour composites; scale and spatial resolution; radiometric correction; bathymetric mapping with remotely sensed data; variable depth compensation for sub-aqueous interpretation; inshore marine habitat mapping; remote sensing for leaf-area indices.

Assessment: 1x 3-hour examination (50%), Class record (50%)

GEOG8Z3 - Coastal Zone Management

(DSE8CZM) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Content: Integrated Coastal Zone Management; Physical processes in the coastal zone; understanding and managing coastal erosion and deposition; use and development of coastlines; coastal environmental impacts; tools of coastal zone management.

Assessment: 1x 3-hour examination (50%), Class record (50%)

Geological Science

Offered in the School of Geological and Computer Sciences

GEOL1E2 - Brief History of the Earth

(DSG1HE2) (20L-0T-18P-0S-38H-0R-0F-4A-6W-8C)

Corequisite: Geol 1L2

Content: An overview of the history of the Earth and its environments from the beginnings 4500 million years ago to the present day. The contribution of the South African geological record.

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL1G1 - Fundamentals of Geology

(DSG1FG1) (20L-0T-18P-0S-38H-0R-0F-4A-6W-8C)

Prerequisite:

Content: Planet Earth: the importance of geological processes in understanding environments past and present. Introduction to Earth history: the rock cycle and the main rock types; fossils; establishing age relationships; measuring geological time. Landscape evolution. Introduction to plate tectonics: distribution of volcanoes, earthquakes, mountain belts, continents and oceans.

Field work : A 2-day field excursion (16 notional study hours)

Assessment: One 1½hour written and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.
The report on the field trip forms 15% of the continuous assessment while the information gathered on the field trip may form up to 33% of the practical examination

GEOL1L2 - Understanding Landscapes

(DSG1UL2) (20L-0T-18P-0S-38H-0R-0F-4A-6W-8C)

Prerequisite: Geol 1G1

Content: Factors in landscape evolution. Rock decomposition and disintegration. Erosion, transportation and deposition processes. Landscapes and bedrock geology. Interaction of surface processes and tectonic processes. Geological hazards. Geological map patterns, 3-D bedrock geology, and surface topography.

Practicals: Field work : A 2-day field excursion (16 notional study hours)

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL1R1 - Rocks & Minerals

(DSG1RM1) (20L-0T-18P-0S-38H-0R-0F-4A-6W-8C)

Corequisite: Geol 1G1

Content: Minerals: an introduction to the rock forming and ore minerals; crystallographic and

compositional classification of minerals; an introduction to the various rock environments in which the different mineral groups are found. Rocks: an introduction to igneous, sedimentary and metamorphic rocks; their compositions, textures and environments of formation.

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2C1 - Coastal & Marine Geology

(DSG2CO1) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 level I credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6), including Geol 1G1

Content: Earth processes: continental drift and plate tectonics, physiography and gross geology of continental margins. Marine geology of Southern Africa. Coastlines: classification and processes. Marine survey tools.

Assessment: One 2-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

Note: In some years this module will be offered in the second semester rather than the first. It will then be designated Geol 2C2 with code DSG2CO2.

GEOL2E2 - Exploration Geophysics

(DSG2EX2) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6) including Geol 1G1 .

Content: An introduction to geophysical methods with applications in mineral exploration and environmental studies: Gravity, magnetic, seismic, electrical, electromagnetic, radioactivity and borehole survey methods

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2F8 - Geology Field Module

(DSG2FM2) (0L-0T-36P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2M1,Geol 2T1

Content: This module has no formal lectures or practicals. It consists of a 10-day field trip in the Winter Semester. Field techniques. Mapping skills. Rock and structural identification. Unravelling the geological history through understanding of field maps.

Assessment: Class record based on individual and group activities, 33%. A written report and production of final map, 67% of final mark. There is no supplementary examination.

GEOL2H1 - Geochemistry

(DSG2CH1) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6) including 16 credits from Chemistry level 1 modules.

Content: Distribution of elements in the Solar System and Earth. Analytical methods and geochemical characterisation of rocks, soils and water. Evaluation and interpretation of environmental geochemical data. Rock forming processes and geochemistry. Geochemical exploration.

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2L2 - Palaeontology

(DSG2PA2) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6) including Geol 1G1

Content: Evolution. Invertebrate classification and evolution. Vertebrate classification and evolution with examples from the African record

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2M1 - Mineralogy

(DSG2MI1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Geol 1G1, Geol 1R1, Geol 1E2, Geol 1L2; Chem1F1

Content: Crystallography: crystal structures, crystal symmetry, indexing. Crystal chemistry: bonding and coordination, pure phases and solid solutions. Description and identification of minerals: compositional and structural classification, principles of mineral optics, identification of rock-forming minerals using the polarising microscope, X-ray diffraction. Nucleation and growth of minerals, physical properties of minerals, mineral stability.

Practicals:

Assessment: One 3-hour written, and one 3-hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2O1 - Soil Resources

(DSG2SO1) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 level I credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6), including Geol 1G1

Content: Weathering processes and soil formation. Soil types: tropical soils, semi-arid and arid soils – their formation and properties. Problem soils. Soil profiling.

Assessment: One 2-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

Note: In some years this module will be offered in the second semester rather than the first. It will then be designated Geol 2O2 with code DSG2SO2.

GEOL2P2 - Petrology

(DSG2PE2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Geol 2M1

Content: Igneous rocks: classification of igneous rocks; phase diagrams; crystallisation and melting processes; composition of the mantle. *Metamorphic rocks:* Compositional and structural characteristics; mineral reactions and reaction sequences, physico-chemical parameters of rock formation using mineral assemblages; tectonic and thermal causes of metamorphism *Sedimentary rocks:* Introduction to sedimentary rock units; classification; sedimentary petrology of terrigenous and carbonate rocks.

Assessment: One 3-hour written, and one 3-hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2S2 - Geostatistics

(DSG2GS2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: 64 credits from modules offered in the Faculty of Science (lists A, B and C of Rule SD6) including Colt 1L1 or 1L2 Computer Literacy.

Content: Basic statistics. Geostatistics; introduction to spatial data, concept of regionalise variables, the semi-variogram and its application, kriging methods, ore reserve calculations, variance

calculations. Gridding and contouring of data.

Assessment: One 3-hour written examination 67% of final mark; class record (continuous assessment) 33% of final mark.

Note: Credit cannot be obtained for the module Stat 1B1 Basic Statistics at the same time as, or after, this module.

GEOL2T1 - Structural Geology

(DSG2SG1) (15L-0T-18P-0S-43H-0R-0F-4A-6W-8C)

Prerequisite: Geol 1G1,Geol 1R1,Geol 1E2 and Geol 1L2.

Content: Purposes, objectives and methods in structural geology; force, stress and strain in a geological context. Brittle deformation of rocks. Introduction to folding. Mechanism of planar igneous intrusions. Stereonets and map exercises

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL2W2 - Water Resources

(DSG2WA2) (15L-0T-21P-0S-40H-0R-0F-4A-6W-8C)

Prerequisite: 64 level I credits from modules in the Faculty of Science (Lists A, B or C of Rule SD6)

Content: The hydrological cycle. Physical and chemical properties of water and water-rock interactions. Fundamentals of groundwater. River morphology, flow and load. Pollution of ground and surface water. Water management. Water Law

Assessment: One 2-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

Note: In some years this module will be offered in the first semester rather than the second. It will then be designated Geol 2W1 with code DSG2WA1.

GEOL3D2 - Geodynamics

(DSG3GY2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2T1 and Geol 2P2

Content: Plate tectonics, basin formation and mountain belts around the world.

Assessment: One 1½hour written, and one 1½hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3E1 - Geotechnical Engineering for Geologists 1

(DNV3GS1) (14L-0T-18P-0S-42H-0R-0F-6A-6W-8C)

Content: Introduction to Soil Mechanics, origin and composition of soils, soil classification, basic physical properties of soils, description of soils, compaction, water in soils, introduction to stresses in soils, description of soils, compaction, water in soils, introduction to stresses in soils (total, effective and pore water stresses).

Assessment: Three practical reports, one test, one project, one assignment, one 2-hour examination

Offered by the School of Civil Engineering, Surveying and Construction in the Faculty of Engineering

GEOL3E2 - Geotechnical Engineering for Geologists 2

(DNV3GS2) (14L-0T-18P-0S-42H-0R-0F-6A-6W-8C)

Prerequisite: DNV3GS1 (mark of 40% or more)

Content: Analysis of settlement of engineering works, including settlements on sands, stress distribution in soils and consolidation settlements on clays.

Assessment: Three practical reports, one test, one project, one assignment, one 2-hour examination

Offered by the School of Civil Engineering, Surveying and Construction in the Faculty of Engineering

GEOL3F8 - Advanced Field Module

(DSG3FM2) (0L-0T-90P-0S-64H-0R-0F-6A-13W-16C)

Prerequisite: Geol 2F8 and Geol 2P2

Content: This module has no formal lectures or practicals. It consists of a 14-day field trip in the Winter Semester. Maintaining a field camp. Literature, map and aerial photograph search. Field and map skills. Identification, measurement and interpretation of rocks, their relationships and structures. Production of geological maps and cross-sections. Report writing and verbal presentations.

Assessment: Class record based on individual exercises and verbal presentation, 33% of the final mark. A written report and production of final map, 67% of final mark. There is no supplementary examination.

GEOL3G1 - Geohydrology

(DSG3GH1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2W2

Content: Nature of groundwater and aquifers. Hydrological principles of groundwater flow. Geology of groundwater occurrence. Chemistry of groundwater. Groundwater and wells. Groundwater quality, development and management.

Assessment: One 2-hour written examination (67%) of final mark, class record, continuous assessment (33%) of final mark

Note: This module may not be offered every year. In some years this module will be offered in the second semester rather than the first.

GEOL3M1 - Mining & Evaluation

(DSG3ME1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Geol 2S2

Content: Mining methods. Mineral appraisal and resource evaluation. Feasibility studies. Case histories.

Assessment: One 3-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3N1 - Environmental Geology

(DSG3EN1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: At least 16 credits from level II modules in Geology

Content: Earth systems and cycles. Hazardous geological processes. Landfill waste siting and management. Impact of mining and mineral processing on the environment. Nuclear waste disposal.

Assessment: One 3-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3O2 - Geology of Ore Deposits

(DSG3OD2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Geol 2P2

Content: Classification of ore deposits; magmatic, hydrothermal, placer and deposits associated with weathering processes. The application of stable isotopes and fluid inclusions in ore deposit studies. Ore petrography.

Assessment: One 3-hour written, and one 3-hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3P1 - Advanced Petrology

(DSG3AP1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Geol 2P2; Geol 2H1

Content: Igneous rocks: world-wide distribution and tectonic setting. Quantitative evaluation of melting and crystallisation, geochemical trends and quantitative assessment of fractionation and melting processes. *Metamorphic rocks:* thermodynamic principles, metamorphic phase equilibria, thermobarometry, P-T time paths and their tectonic significance, microstructures.

Assessment: One 3-hour written, and one 3-hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3R2 - Rock Mechanics

(DSG3RM2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: At least 16 credits from level I modules in Mathematics or Physics; Geol 2T1 Structural Geology

Content: Rock behaviour and testing. Discontinuities. Rock mass classification. Groundwater and rock masses.

Assessment: One 3-hour written examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3S1 - Advanced Sedimentology

(DSG3SE1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2P2

Content: Sedimentary processes. Sedimentary environments and facies models. Sedimentary basins; provenance, stratigraphy and sequence stratigraphy.

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3T1 - Advanced Structural Geology

(DSG3ST1) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2T1

Content: Strain in a geological context. Ductile deformation. Introduction to strain analysis. Stereonet and map exercises.

Practicals: Fieldwork: A 3-day excursion (24 notional study hours)

Assessment: One 1½hour written, and one 1½hour practical examination, 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL3V2 - Geological Evolution of SA

(DSG3GV2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Geol 2P2

Content: Crustal evolution in Southern Africa: 3.5 billion years of earth history.

Assessment: One 1½hour written, and one 1½hour practical examination 67% of final mark; class record (continuous assessment) 33% of final mark.

GEOL7A3 - Applied Geology

(DSG7AGM) (20L-0T-18P-0S-38H-0R-0F-4A-6W-8C)

Content: Review and practical applications of standard methods of soil profiling and rock core logging. Methods of site investigation in South Africa. Earthworks, road construction, quarries and construction materials. Problem soils, settlement, subsidence and slope stability. Engineering geological

problems in KwaZulu Natal.

Assessment: 1x 1½hour written examination (67%); Class record (33%). There will be assessed field-work which will contribute to the class record.

GEOL7B3 - Geotechnical Engineering for Geologists 3

(DNV7GS2) (0L-0T-0P-0S-160H-0R-0F-0A-13W-16C)

Prerequisite: DNV3GS1 (passed) and DNV3GS2 (mark of 40% or more)

Content: Geotechnical investigation. Sampling techniques including trial pits and boreholes, description of the soil profile, in-situ testing including SPT and CPT tests, laboratory testing and analysis of settlement. Slope stability analysis.

Assessment: One geotechnical investigation report, one test, one assignment, one examination (3 hrs).

Offered by the School of Civil Engineering, Surveying and Construction in the Faculty of Engineering

GEOL7C3 - Environmental Technology (Civil Engineering)

(DNV4ET2) (20L-4T-17P-0S-26H-10R-0F-3A-13W-8C)

Content: Fundamentals of environmental engineering and waste management, characterisation of waste waters, pollution of water systems, basic design and management of potable and waste water treatment plants.

Practicals: Characterisation of polluting potentials of waste waters.

Assessment: 1 test, one 2-hour examination

Offered by the School of Civil Engineering, Surveying and Construction in the Faculty of Engineering

GEOL7D3 - Environmental Management (Civil Engineering)

(DNV4EM1) (20L-5T-0P-0S-35H-17R-0F-3A-13W-8C)

Aim: None.

Content: Ecosystem characteristics, structures and processes and responses of these systems to resource developments and engineering interventions; Integrated environmental management (IEM); Environmental impact assessment (EIA), definitions, methodologies and techniques, limitations and value in the policy, planning, design, implementation, operation and decommissioning stages

Practicals: One project scoping report.

Assessment: One report, one test, one 1½hour examination

Offered by the School of Civil Engineering, Surveying and Construction in the Faculty of Engineering

GEOL7E3 - Engineering Geology

(DSG7EGM) (39L-9T-39P-0S-67H-0R-0F-6A-13W-16C)

Prerequisite: 16 credits in undergraduate mathematics or physics modules.

Content: Site investigation; Geophysical exploration; Evacuation; Tunnels and underground chambers; Reservoirs and dams; Construction materials, Foundations.

Assessment: 1 x 3-hour written examination (67%), Class record (33%)

GEOL7F9 - Mines Field Class

(DSG7MFM) (0L-0T-90P-0S-64H-0R-0F-6A-13W-16C)

Content: Site visits to study geological, environmental and engineering aspects of the mining industry.

Assessment: Written report (67%), Field assessment (33%)

GEOL7I3 - Igneous Petrology & Geochemistry

(DSG7IPM) (0L-54T-36P-0S-64H-0R-0F-6A-13W-16C)

Content: Advanced aspects of igneous petrology and geochemistry relating to specific areas in southern Africa. Case studies will relate to crustal evolution, magma genesis and mineralization processes. Field

mapping and sampling, data acquisition and handling, and interpretation are integral parts of the course.
Assessment: Written examination (33%), Class record (67%)

GEOL7M3 - Metamorphic Petrology
(DSG7MPM) (0L-54T-36P-0S-64H-0R-0F-6A-13W-16C)
Content: Advanced aspects of metamorphic petrology, such as geothermobarometry, pressure temperature histories of metamorphic rocks, tectonic settings and heat sources of metamorphism, thermal modeling, metamorphic fluids, reaction-and deformation related microstructures, geochronology.
Assessment: 1x 3-hour written examination (50%), Class record (50%)

GEOL7O3 - Ore Deposits
(DSG7ODM) (0L-54T-36P-0S-64H-0R-0F-6A-13W-16C)
Content: Techniques in ore genesis studies; the hydrothermal system; volcanic-hosted sulphide deposits, sediment-hosted sulphide deposits, Mississippi valley type deposits, structural controls on mineralisation; plate tectonics and mineralisation; fundamentals of mineral processing technology.
Assessment: 1x 3-hour written examination (67%), Class record (33%)

GEOL7P3 - Pollution Studies
(DSG7PSM) (39L-9T-39P-0S-67H-0R-0F-6A-13W-16C)
Prerequisite: 16 credits in undergraduate mathematics or physics modules.
Content: Geochemical control on the inorganic chemical composition of natural waters. Water related problems in South Africa.
Assessment: 1x 3-hour written examination (67%), Class record (33%)

GEOL7P9 - Honours project
(DSG7PRM) (0L-105T-0P-0S-215H-0R-0F-0A-13W-32C)
Content: Independent research project on suitable topic
Assessment: Written report (100%)

GEOL7R3 - Rock Engineering
(DSG7REM) (39L-9T-39P-0S-67H-0R-0F-6A-13W-16C)
Content: Strength of rock masses, rock slope failure mechanisms and analysis, stresses around underground excavations; and their support.
Assessment: 1x 3-hour written examination (67%), Class record (33%)

GEOL7S3 - Sedimentology
(DSG7SDM) (0L-54T-36P-0S-64H-0R-0F-6A-13W-16C)
Content: Advanced concepts in fluvial, aeolian, coastal and shallow marine facies models. Detailed sedimentary analysis of select economically important sedimentary deposits in South Africa.
Assessment: Written examination (33%), Class record (67%)

GEOL7T3 - Structural Geology
(DSG7SGM) (0L-54T-36P-0S-64H-0R-0F-6A-13W-16C)
Content: Advanced aspects of structural geology (stress, strain, brittle and ductile deformation)
Assessment: Written examination (50%), class record (50%)

GEOL7X3 - Special Topics
(DSG7SPM) (39L-9T-39P-0S-67H-0R-0F-6A-13W-16C)
Content: Special Topics in Environmental and Engineering Geology

Assessment: Written examination (75%), Class record (25%)

LAW

In the Faculty of Law (Durban & Pietermaritzburg)

DLW3BEM - BIO-ETHICS

(DLA3BEM) (26L-0T-0P-0S-54H-0R-0F-0A-13W-8C)

Content: The teaching of foundational bio-ethical knowledge and skill that will enable learners to competently reflect upon, address and resolve ethical and socio-cultural issues that they will confront during their training and professional practice. This inter-professional ethics module involves the teachings of ethical theory and reasoning, professional ethics and inter-professional approach to health care decision-making on issues that span inter alia, informed consent, confidentiality, truth telling, genetic engineering, reproductive technologies and related issues, professional obligations, ethics committees, euthanasia, abortion, human and animal experimentation, experimental design and randomized drug trials, treatment of the impaired and the incompetent, national and international health laws, social justice and health care policy

Assessment: Major assignment 50% 1x 3 hr exam 25%; classwork 25%

DLW4ELM - ENVIRONMENTAL LAW

(DLA4ELM) (52L-0T-8P-0S-100H-0R-0F-0A-13W-16C)

Content: Issues concerning the relationship between the law and the environment; the implementation and enforcement of environmental law, including the role of the 1996 Constitution; selected topics including water law and the environment; natural resources law; pollution control law; and land use and planning law.

Assessment: 1 research assignment 33,3% 1x3 hr exam 66,6%

Mathematics

Offered in the School of Mathematical and Statistical Sciences

MATH1B1 - Augmented Maths 1S1

(DSM1SB1) (78L-82T-0P-0S-0H-0R-0F-0A-13W-16C)

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Math 1S1 and, in addition to this, a substantial amount of supplementary material designed for students who are under-prepared for university-level mathematics.

Assessment: One 3-hour examination (80%), the remainder from continuous assessment.

MATH1B2 - Augmented Maths 1S2

(DSM1SB2) (78L-82T-0P-0S-0H-0R-0F-0A-13W-16C)

Prerequisite: Math 1B1.

Content: This module is available only to students registered for the special four-year augmented curriculum in the Faculty of Science. It covers the syllabus of Math 1S2 and, in addition to this, a substantial amount of supplementary material designed for students who are under-prepared for university-level mathematics.

Assessment: One 3-hour examination (80%), the remainder from continuous assessment

MATH1G1 - General Mathematics 1G1

(DSM1SG1) (39L-39T-0P-0S-76H-0R-0F-6A-13W-16C)

Content: Matrices and linear equations. Functions and inverse functions. Heuristic introduction to the theory of limits. Differentiation. Exponential functions and logarithms. Trigonometric functions. Maxima and minima, graph sketching. Antiderivatives and elementary integration. Elementary probability theory and basic statistics.

Assessment: One 3-hour examination.

MATH1G2 - General Mathematics 1G2

(DSM1SG2) (39L-39T-0P-0S-76H-0R-0F-6A-13W-16C)

Prerequisite: Math 1S1 or Math 1A1.

Content: Techniques of integration and Simpson's rule. Applications: discrete growth processes, exponential growth, linear differential equations of first order. Functions of several variables; partial derivatives, maxima and minima. Lagrange multipliers, least squares approximation and applications. Elementary numerical techniques for ordinary differential equations. The Newton-Raphson and secant methods for solving nonlinear equations.

Assessment: One 3-hour examination.

MATH1M1 - Mechanics 1

(DSM1SM1) (39L-49T-0P-0S-66H-0R-0F-6A-13W-16C)

Corequisite: Math 1S1

Content: Kinematics. Newton's laws of motion, forces. Energy and momentum, conservation laws. Circular and simple harmonic motion. Torque, moments of inertia, centres of mass.

Assessment: One 3-hour examination.

MATH1O2 - Operations Research 1

(DSM1SO2) (39L-49T-0P-0S-66H-0R-0F-6A-13W-16C)

Prerequisite: Math 1S1

Content: Linear programming, game theory, difference equations, elementary graph theory.

Assessment: One 3-hour examination.

MATH1S1 - Mathematics 1S1

(DSM1SX1) (39L-49T-0P-0S-66H-0R-0F-6A-13W-16C)

Content: Elementary theory of matrices and linear equations. The real number system. Limits and continuity of real-valued functions. Introduction to the differential calculus; basic theory and applications. Anti-derivatives. The elementary transcendental functions.

Assessment: One 3-hour examination.

MATH1S2 - Mathematics 1S2

(DSM1SX2) (39L-49T-0P-0S-66H-0R-0F-6A-13W-16C)

Prerequisite: Math 1S1.

Content: Introduction to the integral calculus: basic theory, techniques of integration and applications. Vectors, applications to linear geometry. Conic sections. Taylor's theorem. Complex numbers.

Assessment: One 3-hour examination.

MATH2A1 - Linear Algebra
(DSM2SL1) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)
Prerequisite: Math 1S2 or Math 1G2
Content: Abstract vector spaces, linear dependence, and dimensionality. Matrices, determinants, linear transformations. Eigenvalues, diagonalization, quadratic forms. Ordinary differential equations.
Assessment: One 2-hour examination contributing 80% to the final mark; the remainder from continuous assessment (class record).

MATH2C1 - Advanced Calculus 2A
(DSM2SZ1) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)
Prerequisite: Math 1S2 (pass-proceed)
Content: Indeterminate forms, functions of several variables, partial derivatives. Lagrange multipliers. Taylor's theorem. Multiple integrals, change of variable, Jacobians.
Assessment: One 2-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH2C2 - Advanced Calculus 2B
(DSM2SZ2) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)
Prerequisite: Math 2C1
Content: Multiple integrals, vector fields, complex variable theory, sequences and series.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH2D2 - Diff Eq & Maths Models
(DSM2SQ2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2C1
Content: Modelling real world situations in terms of differential equations. First-order and second-order equations. General theory of linear equations. Phase plane and stability theory.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH2M1 - Mechanics 2
(DSM2SE1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 1M1
Corequisite: Math 2C1
Content: Central forces and planetary motion. Moving frames and Coriolis forces. Euler's equations. Lagrange's equations.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH2N2 - Intro Numerical Methods
(DSM2SU2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 1S2
Content: Error analysis, interpolation and polynomial approximation, numerical differentiation and integration, numerical linear algebra.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH2O1 - Info Security & Ops Research
(DSM2SI1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 1S2,Math 1O2
Content: Cryptology: Encryption, Cryptanalysis of substitution ciphers, stream ciphers. Shannon's theory (RSA) and DES. Public key ciphers. Linear programming, integer and zero-one programming. Combinatorial optimization and classical optimization.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3A2 - Algebra
(DSM3SA2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: The theory of groups, rings and fields.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3G2 - Graph Theory
(DSM3ST2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Aspects of Graph Theory and its applications: Distance, connectivity, matchings, hamiltonicity, eulerian graphs, vertex and edge colourings, network flows.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3L1 - Linear Alg & Coding Theory
(DSM3SL1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Topics from Advanced Linear Algebra and an introduction to Coding Theory.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3M1 - Mathematical Methods
(DSM3SO1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Fourier series, integral transform theory, complex analysis.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment and from an assignment which will draw on students' knowledge and skills in a number of areas of mathematics.

MATH3N2 - Numerical Analysis
(DSM3SN2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Orthogonal polynomials, approximation, numerical linear algebra, ordinary differential equations and partial differential equations.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3O2 - Optimal Control
(DSM3SV2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Calculus of variations, basic optimal control, linear-quadratic optimal control. Controllability, observability, stability. Pontryagin's maximum principle. Applications.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3P1 - Partial Differential Equations
(DSM3SC1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: The methods of solution of partial differential equations, such as those of Laplace, Poisson and Schrödinger, the wave and heat equations, special functions, eigenfunction expansions, integral transforms.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3Q2 - Mechanics
(DSM3SM2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: The dynamics of differential equations. Hamiltonian mechanics. Hilbert spaces, bases. Operator representation of quantum mechanics, change of representation. Factorization. Symmetries and algebras. Perturbation methods. Introduction to chaos.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3T2 - Tensor Methods
(DSM3TM2) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Basic tensor theory with applications to a selection of topics from special relativity, electromagnetic theory, mechanics and thermodynamics.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH3Y1 - Analysis
(DSM3SR1) (29L-20T-0P-0S-105H-0R-0F-6A-13W-16C)
Prerequisite: Math 2A1,Math 2C1,Math 2C2.
Content: Uniform convergence, uniform continuity and the interchange of limiting processes. Topology of the reals, introduction to metric spaces and topological spaces.
Assessment: One 3-hour examination contributing 80% to the final mark; the remainder from continuous assessment.

MATH7A3 - Classical Algebra
(DSM7CAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SA2 or equivalent
Content: Further group theory; Galois theory; ring theory.
Assessment: 1x 3-hour examination (100%)

lithography, pollution spreading, photocopier machine and others. Modelling from first principles, theoretical analysis of models, basic numerical procedures.
Assessment: 1x 3-hour examination (100%)

MATH7J3 - Optimization
(DSM7OPM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Unconstrained optimisation. Constrained optimisation.
(Exposure to Functional Analysis would be an advantage).
Assessment: 1x 3-hour examination (100%)

MATH7M3 - Classical Mechanics
(DSM7CMM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Calculus of variations; Lagrangian and Hamiltonian mechanics; canonical transformations and Hamilton-Jacobi theory; conservation laws; Lie algebras; Liouville's theorem and integrable systems; configurational invariants and almost complete integrability.
Assessment: 1x 3-hour examination (100%)

MATH7N3 - Number Theory
(DSM7NTM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Introduction to algebraic number theory, quadratic residues, quadratic and cyclotomic fields, factorization, geometric methods, applications.
Assessment: 1x 3-hour examination (100%)

MATH7O3 - Ordinary Differential Equations
(DSM7ODM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Historical introduction; symmetry; Lie symmetries; differential equations and symmetry; classification of equations; solution of equations; algebras of integrals; partial differential equations; systems of equations; generalized symmetries; Noether's theorem.
Assessment: 1x 3-hour examination (100%)

MATH7P3 - Partial Differential Equations
(DSM7PDM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: First order equations, classification and solutions of second order equations, Cauchy-Kovalevskaya theorem, systems of equations, shocks.
Assessment: 1x 3-hour examination (100%)

MATH7P9 - Honours Project in Mathematics
(DSM7PRM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Some aspect of mathematics is considered under the guidance of a "supervisor", a report is written and an oral presentation given, both of which are graded. It could be a survey, a synthesis or an application of a known method to a new problem. Original research is not expected but the appropriate research methodology is demanded.
Assessment: Report (80%), Oral presentation (20%)

MATH7R3 - General Relativity
(DSM7REM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Curvature and Einstein field equations; Schwarzschild solution and black holes.
Assessment: 1x 3-hour examination (100%)

MATH7A9 - Honours Project in Applied Mathematics
(DSM7PA2) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Some aspect of applied mathematics is considered under the guidance of a "supervisor", a report is written and an oral presentation given, both of which are graded. It could be a survey, a synthesis or an application of a known method to a new problem. Original research is not expected but the appropriate research methodology is demanded.
Assessment: Report (80%), Oral presentation (20%)

MATH7C3 - Cosmology
(DSM7CSM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Robertson-Walker solution and Friedman models; inflation; gravitational waves.
Assessment: 1x 3-hour examination (100%)

MATH7D3 - Differential Geometry
(DSM7DGM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Structure of manifolds; Lie algebras; symmetries and application to physics.
Assessment: 1x 3-hour examination (100%)

MATH7E3 - Numerical Analysis
(DSM7NUM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Approximation theory. The approximate solution of linear operator equations. The nonlinear inverse problem. Additional selected topics.
(Exposure to Functional Analysis would be an advantage).
Assessment: 1x 3-hour examination (100%)

MATH7F3 - Functional Analysis
(DSM7FAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SR1 (or equivalent)
Content: Abstract spaces and their properties, linear operators, fundamental theorems of functional analysis with applications, Hilbert spaces, elements of nonlinear analysis.
Assessment: 1x 3-hour examination (100%)

MATH7G3 - Graph Theory 1
(DSM7G1M) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SH2 (or equivalent)
Content: Digraphs, tournaments, Ramsey theory, graph matchings.
Assessment: 1x 3-hour examination (100%)

MATH7G5 - Graph Theory 2
(DSM7G2M) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SH2 (or equivalent)
Content: Distances, vulnerability, colouring and domination in graphs.
Assessment: 1x 3-hour examination (100%)

MATH7I3 - Industrial Mathematics
(DSM7INM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSMS301, DSM3SP1 or equivalent
Content: Selected case studies from industrial practice involving precipitation of crystals, electron beam

MATH7S3 - Set Theory & Ordered Sets
(DSM7SOM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Axiomatic set theory, ordinal and cardinal arithmetic, axiom of choice. Order, lattices, closure systems.
Assessment: 1x 3-hour examination (100%)

MATH7T3 - Topology
(DSM7TOM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SR1 or equivalent
Content: An introduction to general topology: separation, countability, metrizability. A selection of topics from general and algebraic topology.
Assessment: 1x 3-hour examination (100%)

MATH7U3 - Foundations
(DSM7FOM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Propositional and first order logic; completeness, compactness.
Assessment: 1x 3-hour examination (100%)

MATH7V3 - Universal Algebra
(DSM7UAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Prerequisite: DSM3SA2 or equivalent
Content: Algebras, congruences, varieties and quasivarieties, congruence modularity and distributivity, axiomatization.
Assessment: 1x 3-hour examination (100%)

MATH7W3 - Cryptography
(DSM7CRM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Entropy, block ciphers, stream ciphers, public key systems, signature schemes, key management.
Assessment: 1x 3-hour examination (100%)

MATH7X3 - Coding Theory
(DSM7CDM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Introduction to field theory and design theory. Linear, cyclic, Hamming, Hadamard, Golay and BCH codes.
Assessment: 1x 3-hour examination (100%)

MATH7X5 - Special Topics A
(DSM7TAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Topics in mathematics or applied mathematics, not included in the list of specified modules or additional aspects of the listed modules may be offered.
Assessment: 1x 3-hour examination (100%)

MATH7Y3 - Applied Analysis
(DSM7ANM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Basic topological and metric notions, Banach fixed point theorem with applications, uniform convergence and interchangeability of limiting processes.
Assessment: 1x 3-hour examination (100%)

MATH7Z5 - Special Topics B

(DSM7TBM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)

Content: Further topics in mathematics or applied mathematics, not included in the list of specified modules or additional aspects of the listed modules may be offered.

Assessment: 1x 3-hour examination (100%)

Medical

In the Faculty of Health Sciences (Durban)

MedS1H2 - Human Body: Form and Function

(MPH1HB2) (29L-10T-39P-0S-76H-0R-0F-6A-13W-16C)

Content: Cell membrane transport. Nerves and muscles. Blood. Biochemistry of haemoglobin and plasma proteins. Immunology. Cardiovascular system. Respiratory system. Autonomic nervous system. Central nervous system. Endocrinology. Gastrointestinal tract. Renal system. Temperature Control.

Assessment: Coursework (40%), written examination (60%).

MedS2C1 - Cardio-respiratory Physiology

(MPH2CR1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1, Chem 1F2, Phys 1G1

Content: Functional histology of the cardiovascular and respiratory systems. Gross anatomy of the cardiovascular and respiratory systems. Electrical and mechanical activity of the heart. Dynamics of blood and lymph flow. Cardiovascular regulatory mechanisms. Mechanics of respiration. Gas exchange in the lungs. Pulmonary circulation. Gas transport between the lungs and tissues. Regulation of respiration.

Assessment: Coursework (40%), practical examination and written examination (60%)

MedS2E2 - Endocrine & Renal Physiology

(MPH2ER2) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1, Chem 1F2, Phys 1G1

Content: The function and functional Histology of the endocrine organs, reproductive organs and kidneys. Body fluid and electrolyte balance. Acid base balance.

Assessment: Coursework (40%), practical examination and written examination (60%)

MedS2G2 - Gastrointestinal Tract and Blood

(MPH2GI2) (29L-0T-39P-0S-86H-0R-0F-0A-13W-16C)

Prerequisite: Chem 1F1, Chem 1F2, Phys 1G1

Content: GIT: Composition of food; basic gross anatomy and the functional histology of the formed blood elements and the organs of the gastrointestinal tract and the associated accessory organs/structures; The physiology of the gastrointestinal tract. Blood: Composition and functions of blood; Anaemia; Leucopaenia and leucocytosis; Basic concepts of immunity; Blood groups and transfusion; Haemostasis; Basic diagnostic tests.

Assessment: Coursework (40%), practical examination and written examination (60%)

MedS2N1 - Neurophysiology

(MPH2NP1) (29L-0T-39P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Chem 1F1, Chem 1F2, Phys 1G1

Content: Neural control mechanisms. The sensory systems. Muscle. Control of Body Movement. Consciousness and Behaviour. Basic functional histology.

Assessment: Coursework (40%), practical examination and written examination (60%).

MedH3H1 - Haematology

(MHA3HA1) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)

Prerequisite: 80 credits at level II from modules in the Bio-medical Science programme

Content: Detailed functions of blood. Erythropoiesis. Anaemias. Granulocytes, macrophages and lymphocytes in health and disease. The red membrane. Platelet function and disorders. Haemostasis and its disorders. Inflammation. Immunity. Blood groups and blood transfusions.

Assessment: 2-hour written examination (60%), coursework (40%)

Note: Non-Biomedical Science students taking this module as an elective must be vaccinated against Hepatitis B at their own expense.

MedM3M2 - Medical Microbiology

(MMI3MM2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Nil

Content: Pathogenic mechanisms of micro-organisms, Host defence mechanisms, principles of antimicrobial activity, sterilisation and disinfection, molecular approach to infectious disease e.g. outbreak and population-based analysis for epidemiological control of infection, syndrome based infections.

Assessment: 3-hour written examination (60%), coursework (40%)

Note: Non-Biomedical Science students taking this module as an elective must be vaccinated against Hepatitis B at their own expense.

MedS3B1 - Medical Bio-statistics

(MPH3MB1) (14L-9T-0P-0S-51H-0R-0F-6A-6W-8C)

Prerequisite: 80 credits at Level II from modules in the Bio-Medical Science programme or equivalent

Content: Review of statistical functions and their validity with reference to the specific problems of sample size in clinical medicine. Design of clinical trials. Univariate and multivariate analyses. Type 1 and type 2 errors revisited. The 95% confidence intervals. Clinical interpretation of statistical probability. meta-analysis and evidence based practice.

Assessment: 2-hour written examination (60%), coursework (40%)

MedS3D1 - Metabolic Disease

(MPH3MD1) (29L-9T-12P-0S-104H-0R-0F-6A-13W-16C)

Prerequisite: Biol 2C2

Content: The following major themes: advances in modern molecular biology, abnormal metabolism, inborn errors of metabolism such as phenylketonuria, sickle cell anaemia, etc.; mitochondrial myopathies; collagen disorders..

Assessment: 3-hour written examination (60%), coursework (40%)

MedS3E2 - Bioenergetics and Exercise Physiology
(MPH3BE2) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: Biol 2C1, MedS2G2, MedS2C1, MedS2N1, MedS2E2
Content: Introduction to nutritional requirements of exercise. Energy for physical activity - energy value in food and energy transfer in exercise. Systems of energy delivery and utilization. Work performance and environmental stress. Exercise and the immune system. Aspects of cardiovascular and skeletal muscle Physiology during Exercise and Environmental Exercise Physiology.
Assessment: 2-hour written examination (60%), coursework (40%)

MedS3H2 - Basic Histopathology
(MPH3BH2) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: MedS2G2, MedS2C1, MedS2N1, MedS2E2
Content: Cell and tissue death. Inflammation. Neoplasia. Special staining techniques / light microscopy: Mucin, fat, connective tissue, Iron, Scanning and Transmission Electron Microscopy. Immunocytochemistry. Confocal microscopy. Image analysis.
Assessment: Coursework (40%), written examination (30%), practical examination (30%)

MedS3N2 - Neuro-endocrinology
(MPH3NE2) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: MedS2G2, MedS2C1, MedS2N1, MedS2E2
Content: Basic endocrine disorders, Neurochemistry. Steroid biochemistry. Receptor diseases. Hormone biosynthesis. Pain and its management
Assessment: 2-hour written examination (60%), coursework (40%)

MedS3PB – Research Project
(MPH3RP1/2) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: MedS2G2, MedS2C1, MedS2N1, MedS2E2
Content: Basic endocrine disorders, Neurochemistry. Steroid biochemistry. Receptor diseases. Hormone biosynthesis. Pain and its management
Assessment: 2-hour written examination (60%), coursework (40%)
Note: This module may be done in either semester, but credit may only be obtained once.

MedS3T1 - Environmental Toxicology
(MPH3ET1) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: Biol 2C1
Content: Introduction o secondary metabolism. Secondary metabolites: antibiotics, mycotoxins and plant secondary metabolites will be discussed. Mycotoxins and disease in animals and humans. Biological mode of action of mycotoxins.
Assessment: 2-hour written examination (60%), coursework (40%)

MedS3W2 - Wound Healing
(MPH3WH2) (14L-5T-18P-0S-37H-0R-0F-6A-6W-8C)
Prerequisite: Biol2C1, MedS2C1, MedS2N1, MedS2E2
Content: General Principles of Wound Healing. The role of growth factors in wound healing. Wound healing and wound infection. Chronic wounds. Hypertrophic scars, keloids, and contractures: The cellular and molecular basis for therapy.
Assessment: 2-hour written examination (60%), coursework (40%)

MedV3V1 - Virology
(MVI3MV1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)
Prerequisite: Biol 2C1
Content: Taxonomy of viruses at the molecular level. Description of viruses associated with human and veterinary diseases. Molecular mechanism of viral pathology and immune avoidance
Assessment: 3-hour written examination (60%), coursework (40%)
Note: Non-Biomedical Science students taking this module as an elective must be vaccinated against Hepatitis B at their own expense.

Physics

Offered in the School of Pure and Applied Physics

PHYS1B1 - Augmented Physics 1S1
(DSP1SB1) (69L-19T-72P-0S-0H-0R-0F-0A-13W-16C)
Prerequisite:
Corequisite: Math 1B1 or Math 1G1
Content: Mechanics, oscillations, thermal physics. Learning skills, academic and communication skills. Supplementary foundation material.
Assessment: Two 3-hour written examinations contributing 75% to the final mark, the remainder by continuous assessment (class mark).

PHYS1B2 - Augmented Physics 1S2
(DSP1SB2) (59L-29T-72P-0S-0H-0R-0F-0A-13W-16C)
Prerequisite: Phys 1B1 and Math 1B1 or Math 1G1
Corequisite: Math 1B2 or Math 1G2
Content: Electromagnetism, waves, optics, atomic and nuclear physics. Learning skills, academic and communication skills. Supplementary foundation material.
Assessment: Two 3-hour written examinations contributing 75% to the final mark, he remainder by continuous assessment (class mark).

PHYS1G1 - General Physics 1G1
(DSP1PG1) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)
Content: This module provides a stimulating introduction to the methods and application of physics with particular relevance to the life sciences. It is also intended to provide a firm basis for further studies in physics. It will include bio-mechanics; size, form and function (scaling laws); fluid mechanics and the cardiovascular system; waves, sound and hearing; optics, the eye and vision; the atom and X-rays; the nucleus, radioactivity and nuclear reactions with applications in medicine, biology, geology and astronomy.
Assessment: One 3-hour written examination with a class mark contributing up to 25% to the final mark.

PHYS1G2 - General Physics 1G2
(DSP1PG2) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)
Prerequisite: Phys 1G1, Math 1G1 or Math 1S1
Corequisite: Math 1G2 or Math 1S2
Content: A module intended for students who have completed Phys 1G1 and may wish to advance in Physics and/or Chemistry. It will provide a sound introduction to the methods and application of physics

in everyday experience. It will extend the material in Phys 1G1 giving a quantitative treatment using the mathematical techniques acquired in Math 1G1. At the discretion of the Head of the School admission to level-II modules in Physics may be granted if a sufficiently high mark is obtained in the examination.

Assessment: One 3-hour written examination with a class mark contributing up to 25% of the final mark.

PHYS1S1 - Physics 1S1

(DSP1SC1) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Prerequisite:

Corequisite: Math 1S1 or Math 1G1

Content: Mechanics, oscillations, thermal physics.

Assessment: One 3-hour examination contributing 75% to the final mark, the remainder being by continuous assessment (class mark).

PHYS1S2 - Physics 1S2

(DSP1SC2) (39L-9T-36P-0S-70H-0R-0F-6A-13W-16C)

Prerequisite: Phys 1S1 and Math 1S1 or Math 1G1

Corequisite: Math 1S2 or Math 1G2

Content: Electromagnetism, waves, optics, atomic and nuclear physics.

Assessment: One 3-hour written examination, contributing 75% to the final mark, the remainder by continuous assessment (class mark).

PHYS2A2 - Astronomy

(DSP2AS2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Phys 1S1, 1S2 and Math 1S1, 1S2 (or equivalents)

Content: Planetary and satellite motion; the sun and solar system including comets, meteors and asteroids; tides, lunar and solar; the earth; measurement of time (solar, siderial) and astronomical distances; stars – magnitude scales, spectra, energy sources and stability.

Assessment: One 1½hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS2E2 - Electronics

(DSP2EC2) (14L-0T-18P-0S-44H-0R-0F-4A-6W-8C)

Prerequisite: Phys 1S1, 1S2 and Math 1S1, 1S2 (or equivalents)

Content: Basic circuit theory; AC theory; transformers; semiconductor materials and diodes; transistors; operational amplifiers; digital electronics.

Assessment: One 1½hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

Note: This module may not be offered in 2004

PHYS2M1 - Theoretical Methods

(DSP2TM1) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Phys 1S1, 1S2 and Math 1S1, 1S2 (or equivalents)

Content: Complex variables, partial differentiation, line and multiple integrals, elementary differential equations, determinants, vectors and matrices, vector calculus, transforms, and series. Applications to the Physical Sciences.

Assessment: One 3-hour written examination, 75% to the final mark, the remainder by continuous assessment (class mark).

Note: This module may not be offered in 2004

PHYS2S1 - Physics 2S1

(DSP2SP1) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Phys 1S1, 1S2 and Math 1S1, 1S2 (or equivalents)

Content: Quantum physics, Mechanics, Special Relativity.

Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS2S2 - Physics 2S2

(DSP2SP2) (29L-0T-36P-0S-89H-0R-0F-6A-13W-16C)

Prerequisite: Phys 1S1, 1S2 and Math 1S1, 1S2 (or equivalents)

Content: Oscillations and waves, Thermal physics, Properties of matter

Assessment: One 3-hour written examination, 75% to the final mark, the remainder by continuous assessment (class and practical mark).

PHYS3C2 - Scientific Computing

(DSP3CO2) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Phys 1S1, 1S2 and **either** Math 2A1, Math 2C1, Math 2C2 **or** Phys 2M1.

Content: Scientific computing methods; modelling of physical systems.

Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

This module may only be taken by students already registered in the Applied Scientific Computing programme

PHYS3E1 - Electromagnetism & Optics

(DSP3PB1) (29L-5T-30P-0S-90H-0R-0F-6A-13W-16C)

Prerequisite: Phys 2S1, 2S2 and **either** Math 2A1, Math 2C1, Math 2C2 **or** Phys 2M1.

Content: Electromagnetic field theory; electromagnetic waves; electrodynamics, advanced wave optics.

Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS3P2 - Scientific Computing Project

(DSP3RP2) (0L-0T-78P-0S-76H-0R-0F-6A-13W-16C)

Prerequisite: Comp 2O1

Corequisite: Phys 3C2.

Content: Project on an approved topic in Physics and Scientific Computing, drawing on and integrating material from the modules in Physics, Mathematics and Computer Science which are core to the Programme in Physics and Scientific Computing. The project will include mathematical analysis and computer programming applied to a problem or topic in physics.

Assessment: On the basis of a report of between 3000 and 6000 words, a computer program with results, and a seminar.

PHYS3Q1 - Quantum Mechanics

(DSP3QM1) (29L-5T-30P-0S-90H-0R-0F-6A-13W-16C)

Prerequisite: Phys 2S1, 2S2 and **either** Math 2A1, Math 2C1, Math 2C2 **or** Phys 2M1.

Content: Quantum Mechanics, Atomic Physics.

Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS3S2 - Stat & Solid State Physics
(DSP3SS2) (29L-5T-30P-0S-90H-0R-0F-6A-13W-16C)
Prerequisite: Phys 3Q1.
Content: Statistical Physics, Solid State Physics.
Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS3T2 - Topics in Physics
(DSP3TP2) (29L-5T-30P-0S-90H-0R-0F-6A-13W-16C)
Prerequisite: Phys 3E1
Content: Nuclear Physics, Particle Physics, Astrophysics, Plasma Physics, Space Physics, Computational methods.
Assessment: One 3-hour written examination contributing 75% to the final mark, the remainder by continuous assessment (class and practical).

PHYS7A3 - Astrophysics
(DSP7ASM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Stars, galaxies and the evolution of the universe.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7A5 - Special Topics A
(DSP7SAM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Special Topics
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7A9 - Applied Physics Honours Project
(DSP7APM) (0L-0T-0P-0S-313H-0R-0F-7A-13W-32C)
Content: A research project is undertaken in collaboration with an industrial partner.
Assessment: Evaluation of submitted proposal and report

PHYS7B5 - Special Topics B
(DSP7SBM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Special Topics
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7C3 - Classical Mechanics
(DSP7CMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Lagrangian and Hamiltonian formalism and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7C5 - Superconductivity
(DSP7SCM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The theory (phenomenological OR microscopic) of superconductivity and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7D3 - Data Analysis
(DSP7DAM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Advanced computational techniques will be covered for the analysis and visualization of complex data sets using the Interactive Data Language (IDL).
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7E3 - Electromagnetic Theory
(DSP7EMM) (23L-9T-0P-0S-122H-0R-0F-6A-13W-16C)
Content: Maxwell's equations and applications. Particle-field interactions.
Assessment: 1x 3-hour examination with class work contributing up to 25% of final mark

PHYS7E5 - Advanced Electronics
(DSP7AEM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The use of microprocessors for control and analog.digital interfacing with applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7G3 - Geophysics
(DSP7GPM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Theory and practice of geological survey methods.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7I3 - Instrumentation & Measurement
(DSP7IMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The basic physical principles and use of specialized scientific instrumentation including for example: MRI, lock-in amplifier, box car integrator, gamma and optical spectrometers, SEM, EDS etc.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7L3 - Plasma Physics
(DSP7PPM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Fluid-, kinetic-, and non-linear theory of plasmas.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7L5 - Atomic Processes in Plasmas
(DSP7ATM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The theory of atomic spectra and applications to plasma processes.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7M3 - Mathematical Methods
(DSP7MMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Selected topics in mathematical physics.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7M5 - Materials
(DSP7MSM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Properties of materials.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7O3 - Optics
(DSP7OPM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Laser theory and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7O5 - Electromagnetic Applications
(DSP7EAM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The application of Maxwell's Equations to practical problems.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark
Credit cannot be obtained for both this module and Phys7E3

PHYS7P3 - Scientific Project Management
(DSP7PMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Specialized topics to be covered will include intellectual property, professional liability, patents, software design, database techniques and entrepreneurship.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7P5 - Particle Physics
(DSP7PCM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Theory and applications of high energy physics.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7P9 - Physics Project
(DSP7PRM) (0L-0T-0P-0S-154H-0R-0F-6A-13W-16C)
Content: Theoretical, experimental or computational project
Assessment: Evaluation of submitted report/dissertation

PHYS7Q3 - Quantum Theory
(DSP7QTM) (23L-0T-0P-0S-131H-0R-0F-6A-13W-16C)
Content: Quantum formalism and applications.
Assessment: 1x 3-hour examination with class work contributing up to 25% of final mark

PHYS7Q5 - Foundations of Quantum Mechanics
(DSP7FQM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Conceptual problems in the foundations of quantum mechanics.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7R3 - Special Relativity
(DSP7SRM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The theory of special relativity and its applications to electromagnetic phenomena.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7R5 - General Relativity
(DSP7GRM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The theory of general relativity and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7S3 - Solid State Physics
(DSP7SSM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Classical and quantum theory of solids and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7S5 - Space Physics
(DSP7SPM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The upper atmosphere and solar terrestrial relations.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7T3 - Statistical Mechanics
(DSP7SMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Selected topics in classical and quantum statistical mechanics.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7T5 - Transform methods
(DSP7TMM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Fourier, Laplace and Hilbert transforms and applications.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7U3 - Quantum Mechanics Applications
(DSP7QAM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: The application of quantum theory to practical problems.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark
Credit cannot be obtained for both this module and Phys7Q3

PHYS7X3 - Computational Physics
(DSP7CPM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: Computer simulation applied to physics.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7X9 - Additional Project 1
(DSP7P1M) (0L-0T-0P-0S-76H-0R-0F-4A-6W-8C)
Content: Theoretical, experimental or computational project.
Assessment: Evaluation of submitted report/dissertation

PHYS7Y3 - Chaos
(DSP7CHM) (11L-0T-0P-0S-65H-0R-0F-4A-6W-8C)
Content: An introduction to the theory of deterministic chaos.
Assessment: 1 x 1½hour examination with class work contributing up to 25% of the final mark

PHYS7Z9 - Additional Project 2
(DSP7P2M) (0L-0T-0P-0S-76H-0R-0F-4A-6W-8C)
Content: Theoretical, experimental or computational project.
Assessment: Evaluation of submitted report/dissertation

Psychology

In the Faculty of Community and Development Disciplines (Durban)

PSYC101 - Psychology 1A

(DPS1PY1) (17L-19T-0P-0S-118H-0R-0F-6A-13W-16C)

Aim: To provide students with an introduction to the field of Psychology as a basis for further study in either Psychology and/or Industrial Psychology.

Content: Introduction to Psychology; Evolution; Intelligence; Social Psychology.

Assessment: 4 tests, 1 essay, 3 MCQ exam-equivalents, 1 open-ended exam

PSYC102 - Psychology 1B

(DPS1PY2) (17L-19T-0P-0S-118H-0R-0F-6A-13W-16C)

Aim: To provide students with an introduction to the field of Psychology as a basis for further study in either Psychology and/or Industrial Psychology.

Content: Introduction to Freud; Introduction to Organisational Psychology; Forms of Knowledge.

Assessment: 3 tests, 1 essay, 3 MCQ exam-equivalents, 1 open-ended exam

PSYC203 - Psychology 2A

(DPS2PY1) (36L-20T-0P-0S-100H-0R-0F-4A-13W-16C)

Prerequisite: Psychology 1A and 1B with a minimum mark of 50% for both of these courses in each of the following: the class mark, the multiple choice sections of the examinations (or exam-equivalent tests), and the written (open-ended) sections of the examinations (or exam- equivalent tests

Aim: 1. To acquaint students with the neuropsychological approach to understanding the cognitive and emotional areas of human development from conception to adolescence.

Content: 1. Biological foundations of psychology; 2. Developmental psychology

Assessment: 2 essays, tutorial tasks, 2 tests, 2 exams

PSYC204 - Psychology 2B

(DPS2PY2) (36L-20T-0P-0S-100H-0R-0F-4A-13W-16C)

Prerequisite: Psychology 1A and 1B with a minimum mark of 50% for both of these courses in each of the following: the class mark, the multiple choice sections of the examinations (or exam-equivalent tests), and the written (open-ended) sections of the examinations (or exam-equivalent tests). 128 credit points.

Aim: 1. To enable students to understand the relationship between social processes and individual psychology, and to place the ideas and work in the context of South African psychology in cultural and historical context; 2. To examine the historical development of the study of personality and to introduce students to issues of the measurement of human attributes.

Content: 1. Psychology and Society; 2. Psychological Measurement.

Assessment: 2 essays, tutorial tasks, 2 tests, 2 exams

PSYC305 - Psychology 3A

(DPS3PY1) (48L-18T-0P-0S-248H-0R-0F-6A-13W-32C)

Prerequisite: Psychology 2A and 2B; 256 credit points.

Aim: 1. To extend students' knowledge of psychoanalysis and to apply psychoanalytic theory to social issues and problems, particularly with reference to South Africa; 2. To focus on adolescence as a period of development and explore issues related to youth identities in social context.

Content: 1. Psychoanalysis and social issues; 2. Youth and Development
Assessment: 2 essays, tutorial tasks, 2 tests, 2 exams

PSYC306 - Psychology 3B
(DPS3PY2) (48L-18T-0P-0S-248H-0R-0F-6A-13W-32C)
Prerequisite: Psychology 2A and 2B.; 256 credit points.
Aim: 1. To provide a range of theoretical perspectives on cognition that challenge the usual dichotomous conceptualisations of the relationship between cognition and other realities (biology, culture and self).
Content: 1. Mind and brain. 2. Mind and action. 3. Mind and culture. 4. Mind, self and identity.
Assessment: 2 essays, tutorial tasks, 2 tests, 2 exams

Scientific Writing & Reporting

Offered in the Faculty of Science

SCWR1S1 - Sci Writing & Reporting A
(DSF1RW1) (0L-20T-21P-0S-39H-0R-0F-0A-13W-8C)
Content: Scientific Writing and reporting is a practical course in which students improve their writing though practical experience of a number of different kinds of writing: essay, report and poster. Content is short research projects relating to science. Through these, students develop their ability to use scientific sources, and to write and give oral presentations in science. *There will be a compulsory field trip.*

Assessment: Continuous assessment (written assignments, test and oral presentation).

SCWR1S2 - Sci Writing & Reporting B
(DSF1RW2) (0L-20T-21P-0S-39H-0R-0F-0A-13W-8C)
Content: The module extends the skills developed in SCWR 1S1: ability to use scientific sources, and to write and give oral presentations in science. The types of writing which the module deals with are: essay, report and poster. Content is short research projects relating to science. *There will be a compulsory field trip.*
Assessment: Continuous assessment (written assignments, test and oral presentation).

Statistics and Actuarial Science

Offered in the School of Mathematical and Statistical Sciences

ACSC1A2 - Actuarial Science 1

(DSS1AC2) (39L-39T-0P-0S-76H-0R-0F-6A-13W-16C)

Prerequisite: Stat 1S1, Math 1S1 (70%) to be passed at first attempt.

Content: Compound interest theory. Ordinary annuity functions. Life tables. Whole life annuity and assurance functions. Net premium reserves.
Emerging cost techniques. Introduction to derivatives markets. Pricing via replication. Binomial lattice structures. Black-Scholes pricing formula.

Assessment: One 3-hour examination contributing 80% to the final year mark, the remainder being by continuous assessment.

ACSC2A2 - Actuarial Mathematics

(DSS2AM2) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Acsc 2F1, Stat 2A1.

Content: Survival distributions. Mortality tables. An introduction to assurances and annuities on one life. An introduction to general insurance mathematics.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

ACSC2F1 - Financial Mathematics

(DSS2FM1) (59L-39T-0P-0S-215H-0R-0F-7A-13W-32C)

Prerequisite: Math 1S2, Stat 1S2, Acsc 1A2 (70%), to be passed at the first attempt.

Content: Compound and simple interest, annuities certain and annuities due. Discounted cash flow problems. Valuation of securities. Term structure models. Stochastic interest rate models.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

ACSC3A2 - Financial Economics

(DSS3AC2) (59L-39T-0P-0S-215H-0R-0F-7A-13W-32C)

Prerequisite: Stat 2B2, Acsc 2A2.

Content: Utility theory, stochastic dominance, measure of investment risk, portfolio theory, Stochastic models of security prices, introduction to the valuation of derivative Securities, binomial and Black-Scholes pricing model.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

ACSC3S1 - Stochastic Modelling

(DSS3AC1) (59L-39T-0P-0S-215H-0R-0F-7A-13W-32C)

Prerequisite: Stat 2B2, Acsc 2A2.

Content: Markov Chains, Markov jump processes, Brownian motion, diffusion processes, Monte Carlo simulation techniques, time series analysis, integrated and Co-integrated series.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT1S1 - Statistics 1A

(DSS1SS1) (39L-39T-0P-0S-76H-0R-0F-6A-13W-16C)

Content: Graphical descriptive methods. Numerical descriptive methods. Probability, Probability distributions. Statistical inference including confidence intervals and hypothesis testing. Correlation and regression.
EXCEL will be used for practical work.

Assessment: One 2-hour theory, and one 2-hour practical examination contributing 80% to the final year mark, the remainder being by continuous assessment.

STAT1S2 - Statistics 1B

(DSS1SS2) (39L-39T-0P-0S-76H-0R-0F-6A-13W-16C)

Prerequisite: Stat 1S1, Math 1S1

Content: Probability theory. Random variables. Special discrete distributions. Expected values and moments. Moment generating functions and probability generating functions of discrete distributions.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT2A1 - Statistics 2A

(DSS2SA1) (29L-39T-0P-0S-86H-0R-0F-6A-13W-16C)

Prerequisite: Stat 1S2, Math 1S2.

Content: Univariate continuous distributions, distribution functions, expectation and moment generating functions. Special continuous distributions, bivariate distributions.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT2B2 - Statistics 2B

(DSS2SB2) (59L-78T-0P-0S-176H-0R-0F-7A-13W-32C)

Prerequisite: Stat 2A1, Math 2C1, Math 2A1.

Content: Transformation of variables, the Central Limit Theorem. Point and interval estimation, maximum likelihood estimation. Properties of estimators. Hypothesis testing. Contingency tables and goodness of fit tests. Simple linear regression.

Assessment: Two 3-hour examinations contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT3A2 - Applied Statistics

(DSS3AS2) (29L-29T-0P-0S-96H-0R-0F-6A-13W-16C)

Prerequisite: Stat 3L1

Content: Applied regression analysis. Analysis of variance and experimental design. Quality control. Acceptance sampling. Nonparametric methods. An assignment.

Assessment: One 3-hour examination contributing 80% to the final mark, 10% from continuous assessment

and 10% from an assignment, which will draw on students' knowledge and skills in a number of areas of statistics.

STAT3L1 - Linear Models

(DSS3LM1) (29L-29T-0P-0S-96H-0R-0F-6A-13W-16C)

Prerequisite: Stat 2B2

Content: Topics from linear algebra. The general linear model of full rank and less than full rank. Regression analysis. Analysis of variance.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT3P1 - Probability Theory

(DSS3PT1) (29L-29T-0P-0S-96H-0R-0F-6A-13W-16C)

Prerequisite: Stat 2B2.

Content: Measure-theoretic probability. Characteristic functions. Stochastic convergence. Laws of large numbers.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT3R2 - Random Processes

(DSS3RP2) (29L-29T-0P-0S-96H-0R-0F-6A-13W-16C)

Prerequisite: Stat 3P1.

Content: Branching processes, birth and death process, renewal theory, queues, conditional expectation, Martingales, Bayesian techniques.

Assessment: One 3-hour examination contributing 80% to the final mark, the remaining 20% from continuous assessment (class mark).

STAT7B3 - Bayesian Inference

(DSS7BAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)

Content: Inference and estimation using Bayesian methods.

Assessment: 1x 3-hour examination (100%)

STAT7D3 - Regression Diagnostics

(DSS7RDM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)

Content: Checking the linear model assumptions of normality, independent errors and constant variance. Transformations of variables. The problem of multicollinearity. Other diagnostic tests including Cook's D, DIFFITS and DIFFBETAS.

Assessment: 1x 3-hour examination (100%)

STAT7E3 - Econometrics

(DSS7ECM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)

Content: Simultaneous equation models. Error in variables. Distributed lags. Heteroscedasticity and autocorrelation.

Assessment: 1x 3-hour examination (100%)

STAT7F1 - Financial Mathematics 1A

(DSS7F1M) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)

Content: An introduction to financial markets. Ito calculus. Stochastic differential equations. Equivalent probability measures. Girsanov Theorem. Discrete time mathematical finance: Cox-Ross-Rubenstein

model, binomial approximations.
Assessment: 1x 3-hour examination (100%)

STAT7F2 - Financial Mathematics 1B
(DSS7FMM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Exotic options, interest rate models, short rate models Heath-Jarrow-Morton forward rate models, Monte Carlo estimation techniques, Continuous time models, Black Scholes Model.
Assessment: 1x 3-hour examination (100%)

STAT7F3 - Financial Mathematics 1C
(DSS7FCM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Pricing exotic options and interest rate swaps
Assessment: 1 x 3-hour examinations (100%)

STAT7F4 - Financial Mathematics 1D
(DSS7FDM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Pricing interest rate options from a discrete time perspective
Assessment: 1 x 3-hour examinations (100%)

STAT7F5 - Financial Mathematics 1E
(DSS7FEM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Advanced Topics in Stochastic Calculus
Assessment: 1 x 3-hour examinations (100%)

STAT7F6 - Financial Mathematics 1F
(DSS7FFM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: An introduction to V-Basic and Excel with application in the financial markets
Assessment: 1 x 3-hour examinations (100%)

STAT7F7 - Financial Mathematics 1G
(DSS7FGM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Extensions to the Black-Scholes modeling paradigm, the Greeks and other topics
Assessment: 1 x 3-hour examinations (100%)

STAT7L3 - The Generalized Linear Model
(DSS7LMM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: The theory of the generalized linear model and goodness of fit. Applications including the loglinear model for nominal and ordinal data, the logistic regression model and the Poisson regression model.
Assessment: 1x 3-hour examination (100%)

STAT7M3 - Multivariate Analysis
(DSS7MAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: The matrix normal distribution. The Wishart distribution. Hotelling's T -squared distribution. Wilks' likelihood ratio test. Roy's union intersection procedure. Simultaneous test procedures. MANOVA. Profile Analysis. Principal Components. Canonical Correlation.
Assessment: 1x 3-hour examination (100%)

STAT7P3 - Probability Theory
(DSS7PTM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Advanced probability theory with the relevant measure theory.
Assessment: 1x 3-hour examination (100%)

STAT7P9 - Honours Project in Statistics
(DSS7PRM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Aim: .
Content: A project of either a theoretical or practical nature from a list of suggested topics under the guidance of a "supervisor" will be undertaken, a typed report submitted and an oral presentation given.
Assessment: Report (80%), Oral presentation (20%)

STAT7Q3 - Queueing Theory
(DSS7QTM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: An introduction to queueing theory. Single-server exponential queueing models. Simple Markovian birth-death queueing models. Simulations and application.
Assessment: 1x 3-hour examination (100%)

STAT7R3 - Random Processes
(DSS7RPM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Queueing theory. Renewal processes. Markov processes. Brownian motion.
Assessment: 1x 3-hour examination (100%)

STAT7S3 - Sampling Theory
(DSS7STM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Simple random sampling. Estimating a mean, a total and a proportion. Ratio estimators. Cluster sampling. Stratified sampling. Systematic sampling.
Assessment: 1x 3-hour examination (100%)

STAT7S5 - Special Topics in Financial Mathematics 1A
(DSS7SAM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Special Topics
Assessment: 1 x 3-hour examinations (100%)

STAT7S7 - Special Topics in Financial Mathematics 1B
(DSS7SBM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Special Topics
Assessment: 1 x 3-hour examinations (100%)

STAT7T3 - Time Series Analysis
(DSS7TSM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: The Box Jenkins model including the AR, MA ARMA and ARIMA models. The state space model. Non-linear time series.
Assessment: 1x 3-hour examination (100%)

STAT7X3 - Advanced Topics in Statistics A
(DSS7ATM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Topics in statistics, not included in the list of specified modules or additional aspects of the listed

modules, e.g. multivariate analysis, time series analysis, econometrics may be offered.
Assessment: 1x 3-hour examination (100%)

STAT7Z3 - Advanced Topics in Statistics B
(DSS7TBM) (29L-10T-0P-0S-115H-0R-0F-6A-13W-16C)
Content: Further topics in statistics, not included in the list of specified modules or additional aspects of the listed modules may be offered.
Assessment: 1x 3-hour examination (100%)

VISION AND MISSION STATEMENT – UNIVERSITY OF KWAZULU-NATAL

Preamble

The creation of a new institution is an exciting opportunity to bring into being a genuinely South African university, with a new culture and form, designed to meet the challenges of serving the country and the region in innovative and effective ways. This socially responsive institution will be a world-class university, and an active global player while still serving the KwaZulu-Natal and SADC regions.

Vision

To be the premier university of African scholarship.

Mission

A truly South African university that is academically excellent, innovative in research, critically engaged with society and demographically representative, redressing the disadvantages, inequities and imbalances of the past.

Principles and Core Values

The University commits itself to the principles and values enshrined in the constitution of the Republic of South African and articulated in the preamble to the Higher Education Act of 1997 (as amended).

Goals

The goals of the University are to:

- Promote access to learning that will expand educational and employment opportunities for the historically disadvantaged, and support social transformation and redress.
- Create and develop an enabling environment for all learners and scholars to pursue their studies in accordance with the principles of academic freedom.
- Advance knowledge and culture through globally competitive teaching, learning, scholarship and research, innovation and scientific investigation.
- Foster a capacity for independent critical thinking, free engagement in fundamental discovery and a reappraisal and extension of traditional views of the world amongst students and staff.
- Support and contribute, across the academic enterprise, to national and regional development, and the welfare and upliftment of the wider community.
- Provide holistic education which promotes an awareness of social responsibility and sound ethical practice in a diverse society.
- Promote and foster tolerance and respect for multilingualism, diverse cultures and social values.
- Promote excellence in teaching and learning through creative and innovative curriculum design and development, pedagogical strategies and assessment practices in accordance with sound quality assurance principles.
- Strengthen the institution through local and international collaboration, exchanges and partnerships with the private sector and higher education institutions in teaching, research and development enterprises.
- Conserve the physical environment, and foster a culture of responsible, ethical, sustainable use of natural resources.
- Increase opportunities for lifelong learning in response to the educational, social, political, scientific and economic challenges of our time.
- Equip graduates to serve as future leaders of the nation.
- Ensure effective governance through democratic representation, accountability, and transparency.
- Promote the social and personal well-being of staff and students, and foster the realization of their full human potential.

The University views this vision and mission statement as a reflection of its core values and commitments. In carrying out its various activities, the University seeks to contribute to the building of a just South African society.