

Faculty of Science



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Computer Science

Environmental &
Geographical Science

Applied Physics

Mathematics Genetics

Applied Biology

Ecology & Astrophysics

Evolution Mathematical
Statistics

Chemistry Biochemistry

Microbiology

Business Computing

Archaeology

Human Geology
Physiology

Computer Games
Development

Mathematics

Computer Engineering

Oceanography &
Marine Biology

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The Faculty of Science at UCT enjoys a high national and international reputation for the quality of its teaching, research and outreach programmes. It is a leading science faculty whose undergraduate and postgraduate programmes are internationally recognised.

The Faculty offers an exciting suite of majors (details of which follow), leading to the BSc degree. The courses offered within the degree structure are characterised by their coherence, a good balance between breadth and depth, and their inter-disciplinary nature. The degree is structured in such a way as to provide graduates with the range of skills that the job market demands. In addition, a variety of opportunities exist for postgraduate study in all Departments; the BSc degree leads to Honours, Masters and Doctoral degrees. All degrees in the Faculty enjoy a high reputation in the private and public sectors in South Africa, as well as internationally.

Many career opportunities are available to BSc degree graduates but most of our graduates go on to a postgraduate qualification, which greatly improves the kind of career options available. You should regard your undergraduate degree as the start of a life-long learning and growing process.

THE DEPARTMENTS IN THE FACULTY ARE

Archaeology

Astronomy

Botany

Chemistry

Computer Science

Environmental and Geographical Science

Geological Sciences

Mathematics and Applied Mathematics

Molecular and Cell Biology

Oceanography

Physics

Statistical Sciences

Zoology



ADMISSION REQUIREMENTS FOR 2012

NSC results are the primary guide for admission to the BSc degree. However, all applicants to the Science Faculty are required to write the NBTs (Academic Literacy, Quantitative Literacy and Mathematics).

(I) ADMISSION CRITERIA FOR APPLICANTS HOLDING THE NATIONAL SENIOR CERTIFICATE (NSC)

Admission to the Faculty of Science requires an applicant to have achieved an APS of 435 points or above (sum of percentages achieved in the best six NSC subjects, including English but excluding Life Orientation; those who pass Mathematics Paper 3 may add an additional 20% of their Mathematics Paper 3 result – maximum 20 points).

Besides taking the NSC results into account for admission, other factors including NBTs, availability of places and educational background will be considered. Applicants with an APS score in the range 400 to 435 points, or with higher score but who do not meet the mainstream subject requirements (see below) will be considered for the General Entry Programme for Science (GEPS, see below).

GENERAL ENTRY PROGRAMME FOR SCIENCE (GEPS)

Admission to the Science Faculty is either directly into a major within the BSc degree, or via the General Entry Programme for Science (GEPS). Students in GEPS register for a year of intensive half-courses in Mathematics, and three from Chemistry, Computer Science, Life/Earth Sciences and Physics. Students then register for a major in their second year. GEPS is run in association with the Academic Development Programme (ADP) and offers students the opportunity to establish a sound educational foundation before proceeding in their second year to their chosen major. The minimum time for a GEPS student to complete the BSc degree is therefore four years. Admission is restricted and is at the discretion of the Dean.

SUBJECT ENTRANCE REQUIREMENTS

Besides scoring at least 435 points, applicants must meet subject entrance requirements as set out in the table below, which shows the minimum requirements for admission to the respective majors. Meeting these requirements does not guarantee admission. Admission may be limited due to available capacity.

ADMISSION CRITERIA FOR APPLICANTS HOLDING THE NATIONAL SENIOR CERTIFICATE (NSC)

	Minimum requirements to be eligible for admission in 2012	Probable/likely offer level [the actual APS level down to which offers are made will be determined by the size and strength of the applicant pool]
BSc Majoring in: Applied Biology, Applied Mathematics/Astrophysics/ Chemistry/Ecology & Evolution/ Geology/Genetics/Human Physiology/Mathematical Statistics/Mathematics/ Microbiology/Oceanography & Marine Biology/Physics	NSC APS of 435 Mathematics 6 (70%) & Physical Science 5 (60%) NBT in Mathematics, AL & QL to be written	Redress categories* APS 435 Mathematics 6 (70%) & Physical Science 5 (60%) Open category and international applicants with the NSC APS of 450 Mathematics 6 (70%) Physical Science 5 (60%)

ADMISSION CRITERIA FOR APPLICANTS HOLDING THE NATIONAL SENIOR CERTIFICATE (NSC) (cont)

	Minimum requirements to be eligible for admission in 2012	Probable/likely offer level (the actual APS level down to which offers are made will be determined by the size and strength of the applicant pool)
BSc Majoring in: Business Computing/ Computer Engineering/ Computer Games Development/Computer Science	NSC APS of 435 Mathematics 6 (70%) Physical Science 5 (60%) or Information Technology 5 (60%) NBT in Mathematics, AL & QL to be written	Redress categories* APS 435 Mathematics 6 (70%) & Physical Science 5 (60%) or Information Technology 5 (60%)
		Open category and international applicants with the NSC APS of 450 Mathematics 6 (70%) & Physical Science 5 (60%) or Information Technology 5 (60%)
BSc Majoring in: Archaeology/ Environmental & Geographical Science	NSC APS of 435 Mathematics 6 (70%) Physical Science 5 (60%) or Life Sciences 5(60%) NBT in Mathematics, AL & QL to be written	Redress categories* APS 435 Mathematics 6 (70%) & Physical Science 5 (60%) or Life Sciences 5(60%)
		Open category and international applicants with the NSC APS of 450 Mathematics 6 (70%) Physical Science 5 (60%) or Life Sciences 5(60%)
Extended Programme (available to redress categories only)		
General Entry Programme for Science (GEPS)	NSC APS 400 Mathematics 5 (60%) and Physical Science 4 (50%) or Life Sciences 4 (50%) NBT in Mathematics, AL & QL to be written	APS of 410 Mathematics 5 (60%) and Physical Science 4 (50%) or Life Sciences 4 (50%) (The expected APS will depend on the size and strength of the applicant pool. There are only 90 places in the GEPS programme.)

If Mathematics Paper 3 is passed with at least 40%, then 20% of the final mark will be added to the APS total (max of 20 bonus points).

**If you are in a category we judge to have been affected by inequality and disadvantage, you could expect to be offered a place with results / APS as listed here.*

Acceptance into the Science faculty does not guarantee acceptance into your chosen major. Formal acceptance for specific majors only takes place at the start of the second year on registration for the second year level courses. A number of majors (currently Biochemistry, Genetics, Geology, Human Physiology and Microbiology) have limits on the number of students accepted into second year level courses. Selection criteria, based on academic performance in first year courses, are outlined to students during the first year of study. Students will be advised in their first year to take courses which could lead to several majors.

(II) TRANSFERRING STUDENTS

UCT will consider applications from students wishing to transfer to UCT's Science Faculty for which the BSc degree who have -:

- a) passed all first-year courses at another institution within two years, and bring with them at least four full courses (or the equivalent) that earn credit and exemption at UCT (see note below); (Please note that as places are limited only applicants who have passed all first-year courses in their first year elsewhere, or who have completed more than the prescribed first-year courses by the end of a second year are likely to be successful in winning a place at UCT.)
- b) not been refused readmission by another tertiary institution; and
- c) not been registered at another tertiary institution for more than two years.

Note: UCT may give credit for, and/or exemption from, a maximum of four full courses (or the equivalent in half courses) completed elsewhere if these courses are recognised by UCT. Senior major courses may not be transferred for credit or exemption. It is the applicant's responsibility to obtain, from the relevant UCT departments, signed approval of credit and exemption for the courses they wish to transfer, before their applications will be considered.

(III) MINIMUM REQUIREMENTS FOR APPLICANTS WITH OTHER THAN SOUTH AFRICAN QUALIFICATIONS

To be considered for admission, applicants must qualify for an exemption from the Matriculation Board (Umalusi). In the case of applicants not writing South African Senior Certificate examinations, offers of places may be made subject to such exemption being obtained. In addition candidates must meet the following minimum requirements:

A-, AS- and O-Level (University of Cambridge)

- At least 2 A-level subjects including Mathematics and a Science subject
- At least D for A-level Mathematics, or B for Additional Mathematics at O-Level

- Note:** O-Level Mathematics is not acceptable
- At least E in Chemistry or Physics or Biology at A-Level.

- At least 4 AS-level subjects including Maths and a Science subject. Only grades A to D are acceptable; the rest can be O-level subjects (grades A to C).
- At least C for AS-level Maths.
- At least D in Chemistry or Physics or Biology at AS-level.

International Baccalaureate (IB)

- At least 30 points (include Extended Essay and Theory of Knowledge score)
- Three Higher Level (HL) subjects
- Mathematics and a Natural Science subject with at least Grade 4 at HL or at least grade 5 SL for Math Method or Mathematics (Mathematics Studies is NOT acceptable)
- English (at least at SL)
- Applicants must be in possession of the Diploma and not the Certificate of the IB.

HIGCSE and IGCSE

- At least 4 HIGCSE subjects including English (1st or 2nd language) and Mathematics as well as Biology or Physical Science, and at least 1 IGCSE subject.
- Only Grades 1, 2 or 3 are acceptable for HIGCSE.
- Only Grades A, B and C are acceptable for IGCSE.

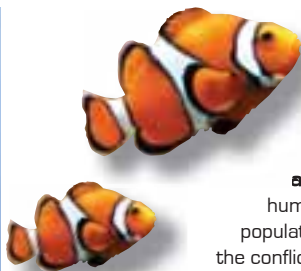
Abitur

- At least "Gut" for Mathematics (>70%)
- Grades 1, 2 or 3 for Physics or Chemistry or Biology (>55%)
- English as a 1st or 2nd language subject AICE (Advanced International Certificate of Education)
- The equivalent of 5 full courses
- Grades A-D are considered as passes; only merit or distinction is acceptable
- English, Mathematics and a Science subject are required.

Note: Applicants with only O-Level and/or IGCSE subjects need to complete the first year at a local university, before applying to the University of Cape Town.

If you have not completed Physical Science or Chemistry in your school-leaving examinations, restrictions may be placed on your choice of curriculum.

Applied Biology



Applied Biology is the science of studying how living organisms

are affected, or are affected by,

humans. As global

populations increase,

the conflicts between

people and nature escalate

bringing new challenges as to

how the environment can be protected while

societies meet their needs of agriculture,

forestry and the harnessing of energy and water.

The problem is especially acute on the African

continent where impoverished communities

coexist with some of the world's most intriguing

biodiversity and where medical, veterinary and

agricultural pests abound. This course uses a

mix of lectures, practical classes and field trips

to teach the theory and practice of conserving

natural systems and of avoiding human conflicts

with nature. The courses cover topics such

as climate change, invasive species, and

conservation and society. Regional, national and

continental examples are used to emphasise

the uniqueness of the situation from an African

perspective.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Anyone who is concerned with the well-being and conservation of natural ecosystems and endangered species.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Applied Biology.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- BIO1004S - Biological Diversity
- CEM1000W - Chemistry 1000

- MAM1004F - Mathematics 1004
- STA1007S - Bionumeracy

2ND YEAR LEVEL COURSES

- BIO2010F - Principles of Ecology and Evolution
Two of
- BIO2013S - Life in the Sea
- BIO2012S - Life on Land: Plants
- BIO2011S - Life on Land: Animals

3RD YEAR LEVEL COURSES

- BIO3013F - Global Change Biology
- BIO3014S - Conservation: Genes, Populations and Biodiversity

CAREER OPPORTUNITIES FOR GRADUATES

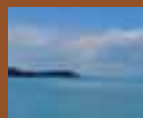
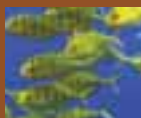
As human societies increasingly realise that their future depends on the conservation of ever-dwindling unspoilt natural areas, there is an escalating demand for expertise in how to protect natural resources and sustain them through responsible utilisation. Graduates will find career opportunities in conservation; wildlife parks; agriculture; forestry; urban development; water affairs and fisheries.

Careers will include both the practical side of conservation as well as research into how best to develop conservation practices.

ADMISSION AND SUBJECT REQUIREMENTS

NSC: APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Applied Mathematics

$$e^{\pi i} + 1 = 0$$

Applied mathematicians transfer mathematical knowledge and methods into other fields, such as physics, computer science, engineering, biology and the social sciences. In this way mathematics has become one of the most powerful promoters of scientific developments, since all modern sciences are founded essentially on mathematical principles. Many technological developments such as mobile phones, computers, cars, aeroplanes and large telescopes were unthinkable without mathematical progress.

WHO WOULD BE INTERESTED?

Students who are interested in mathematics and science in general and who are excited about analyzing complex problems in mathematics and other scientific disciplines should seriously consider majoring in applied mathematics. While the ability and confidence to learn mathematics is required, even more important is a fascination with solving mathematical problems that are relevant to physics, chemistry, computer science, biology and many other disciplines.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Applied Mathematics.

1ST YEAR LEVEL COURSES

- MAM 1000W - Mathematics I
- MAM 1043H - Modelling & Applied Computing
- MAM 1044H - Dynamics

2ND YEAR LEVEL COURSES

- MAM 2000W - Mathematics II
- MAM 2046W - Applied Mathematics II

3RD YEAR LEVEL COURSES

- MAM 3040W - Applied Mathematics III

Many students major in both mathematics and applied mathematics because there is considerable overlap in the

requirements of the two majors and because this approach leads to the broadest possible range of career opportunities and the deepest possible understanding of mathematics in general. Other popular combinations are with physics, astrophysics, chemistry or biology.

CAREER OPPORTUNITIES FOR GRADUATES

Applied Mathematics is a popular subject among students. Applied mathematicians have excellent career opportunities and they are highly valued by employers for their problem solving skills and their excellent ability in analysing complex and abstract problems. The fact that these skills are transferable and that mathematics is relevant to almost every aspect of modern life explains why mathematicians have a huge variety of job opportunities. Nowadays applied mathematicians work in research departments, engineering laboratories, observatories, software companies, education, actuarial sciences, finance and many other fields.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written





The Department of Archaeology, taking advantage of its location in a region rich in archaeological heritage, with evidence of human occupation for the last million years, offers courses that focus on the prehistory of Africa, with a particular focus on Southern Africa. Specific research interests include issues related to human evolution; the emergence of modern humans, and the history of hunter-gatherer, pastoralist and farming communities in southern Africa, and the archaeology of more recent colonial settlement

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Students with a deep interest in

- African People and the African Past
- Human Origins and Evolution
- Heritage Management and Conservation
- Interdisciplinary Studies
- Fieldwork and Excavation
- Solving Complex Puzzles

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Archaeology.

1ST YEAR LEVEL COURSES

- GEO1009F - Introduction to Earth & Environmental Sciences
OR
- EGS1004S - Introduction to Earth & Environmental Sciences
AND
- AGE1002S - Africa & World Archaeology
- MAM1004S - Mathematics 1004
- STA1000S - Statistics 1000

2ND YEAR LEVEL COURSES

- AGE2011S - Human Evolution
- AGE2012F - Southern African Hunters & Herders

3RD YEAR LEVEL COURSES

- AGE3013H - Archaeology in Practice
AND

- AGE3011F - Roots of Black Identity
OR
- AGE3012S - Global Interaction & the Transformation of South African Society

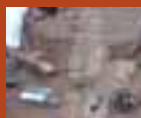
CAREER OPPORTUNITIES FOR GRADUATES

Many people who study archaeology aspire to be academic archaeologists – to teach at universities, undertake research and publish their findings. These people might focus on a range of subspecialties, including studies of bone chemistry and biology, genetics (both modern and ancient), stone tool analysis (including the study of the material properties of rock), metallurgy, rock art, and ethnography. Archaeologists also work in museums, and in this context also pursue academic careers, with the added responsibility of managing collections so that they can be studied by future archaeologists and displayed for public education. Archaeologists can also enter the field of Contract Archaeology, where they work as consultants in development projects of all kinds (urban sprawl, dams, roads, power stations and power lines).

A degree in Archaeology can also be useful for careers outside of the field. A whole range of specialists work on questions for which the skills gained through an archaeology degree are very useful: zoologists or chemists studying animal bone; geologists and other landscape specialists who work with geographic information systems; people in the tourism industry or those involved in rural and community development where heritage is often a resource around which jobs can be created; environmental impact assessors; people involved in policy development and in the national and provincial heritage agencies.

ADMISSION AND SUBJECT REQUIREMENTS

NSC: APS of 435
Mathematics 6 (70%); Physical Science 5 (60%) or Life Sciences 5(60%); NBT in Mathematics, AL & QL to be written



Astrophysics

The Astrophysics major requires a strong mathematics and physics foundation and offers three streams

- A classical one with a strong link to physics (possibly leading to a double major in Physics and Astrophysics)
- One with an additional applied mathematics component (also with an opportunity for a double major)
- One where it is possible to focus on the area of Astro-Engineering by including specific Engineering courses.

The astronomy courses offered are a general introductory first-year course which includes the 'Starfinder' course held in the Iziko Planetarium as well as night-sky viewing, a second-year course which covers nearly all aspects of modern observational astronomy, while the two third-year courses enter into the physical processes that lie at the origin of the observed astronomical phenomena.

It should be noted that UCT is the only South African university that offers a full taught astrophysics programme at the undergraduate level. At the postgraduate level the Astronomy Department offers a Masters of Science in Astronomy and PhD programme (both by dissertation). The Department furthermore offers BSc Hons and Masters of Science in Astrophysics and Space Science (coursework and dissertation) through the National Astrophysics and Space Science programme, an interacademic programme hosted by UCT.

WHO WOULD BE INTERESTED?

The exploration of the Universe is arguably among the most fascinating fields in science. Astronomers are driven by curiosity to find answers to still poorly understood questions such as 'what was the early universe like?', 'how do black holes form?', and 'what is dark matter and dark energy?' If these questions intrigue you, then studying astronomy will help provide some answers.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Astronomy.

1ST YEAR LEVEL COURSES

- PHY1004W - Matter & Interactions
- MAM1000W (or equivalent) - Mathematics I

2ND YEAR LEVEL COURSES

- AST2002S - Introduction to Modern Astrophysics
- MAM2000W - Mathematics II
OR
- MAM2004H - Mathematics 2001
AND
- MAM2046W - Applied Mathematics
- PHY2014F - Waves & Electromagnetism
- PHY2015S - Classical & Quantum Mechanics

3RD YEAR LEVEL COURSES

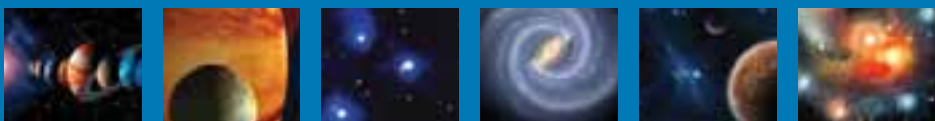
- AST3002F - Stellar Astrophysics
- AST3003S - Galactic & Extragalactic Astrophysics

CAREER OPPORTUNITIES FOR GRADUATES

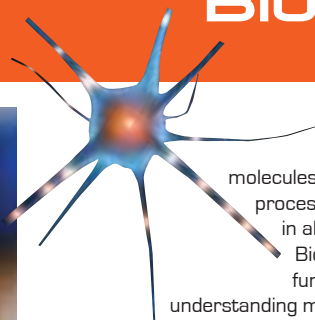
The BSc degree in Astrophysics is by no means limited to a career in astronomy. It gives a solid basis for various other graduate studies in science, technology or engineering fields. You will be well prepared for job opportunities in areas related to astronomy such as instrumentation design, software development, digital processing, computer science, telecommunication, laboratories, teaching, science education and writing, and even in business.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Biochemistry



Biochemistry is the study of the molecules and chemical processes which occur in all living organisms.

Biochemistry is fundamental to understanding mechanisms in molecular and cell biology and

straddles the medical, biological, chemical and physical sciences. The Biochemistry major at UCT includes the study of the structures, physical properties and functions of proteins, carbohydrates, lipids, and nucleic acids; the mechanisms of enzyme action; the chemical regulation of metabolism and energy utilisation; and can include a more in depth study of the molecular basis of cell signaling and gene expression, disease as well as biotechnology.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Students wishing to gain fundamental knowledge and insight into the structure, function and regulation of molecules in all biological systems and processes.

These courses would be suitable for students who wish to specialize in the fields of Biochemistry, Genetics, Microbiology, Chemistry, Physiology, Applied Biology, Ecology and Evolution and Ocean and Marine Biology.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Biochemistry.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004 (or MAM1000W Mathematics I)
- STA1007S - Bionumeracy

2ND YEAR LEVEL COURSES

- MCB2014F - Molecular Components of Cells
- MCB2015S - Metabolism

3RD YEAR LEVEL COURSES

- MCB3020F - Protein Structure & Function
- MCB3024S - Defence & Disease
- MCB3012Z - Research Project in Molecular and Cell Biology

CAREER OPPORTUNITIES FOR GRADUATES

A qualification in Biochemistry can lead to career opportunities in a wide range of fields, including managerial, marketing or research positions in all industries related to biological processes and products e.g. pharmaceutical and biotechnology industry, and food and beverage sciences. Research positions in all fields of medicine and animal/plant science.

ADMISSION AND SUBJECT REQUIREMENTS

Applicants must attain a National Senior Certificate with at least 36 points and need to have a minimum of Mathematics 5 & Physical Science 5 (NSC rating).



Business Computing

Business Computing is a degree that combines elements from Science and Commerce and enables students to develop a well-rounded combination of skills in the areas of Computer Science and Information Systems. This programme allows students to develop a detailed understanding of the software development process, including the business context. Not only will it allow students to understand the information technology needs of a business, but will equip them with the skills to create that technology.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

This programme will be of interest to those students with a passion for technology and the possibilities it offers for economic development. Computing technology is tightly interwoven into all aspects of modern business and this programme equips students to be on the forefront of developing technologies for business.

WHAT COURSES WILL YOU TAKE?

(Business Computing is linked to the Computer Science major)

1ST YEAR LEVEL COURSES

- CSC1015F – Computer Science 1015F
- CSC1016S – Computer Science
- MAM1000W – Mathematics 1

2ND YEAR LEVEL COURSES

- INF2009F – Systems Development A
- INF2011S – Systems Development B
- CSC2001F – Computer Science
- CSC2002S – Computer Science

3RD YEAR LEVEL COURSES

- INF3011F – IT Management
- INF3012S – IT Applications
- INF3014F – Electronic Commerce
- CSC3002F – Computer Science
- CSC3003S – Computer Science

CAREER OPPORTUNITIES FOR GRADUATES

There is significant demand and an undersupply of technical graduates with high-end skills in Software Engineering, Project Management and Software Development as offered by this programme. Graduates will be well placed to enter the field as programmers and system analysts in any sector that requires information technology, such as banking and insurance, and will likely progress quickly to project leader and management positions.



ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%); Physical Science 5 (60%) or Information Technology 5 (60%); NBT in Mathematics, AL & QL to be written



Chemistry

Chemistry is often called the 'central science' because it forms the basis of every living and non-living entity in the universe. It has evolved from the time of the 16th Century alchemist to the present day chemist who uses advanced scientific and computational methods.

It is the interface between the mathematical, physical and biological sciences. Some 1700 undergraduate students from the Faculties of Science, Engineering & the Built Environment, and Health Sciences complete courses in the Department of Chemistry each year.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

This programme would appeal to students who are naturally curious about understanding the world around them and are interested in investigating events at the atomic and molecular level. Some chemists work in a lab, testing hypotheses with experiments while others may work on a computer developing theories or models or predicting reactions. Many chemists develop new products such as paints, foods, pharmaceuticals, clothing or other products for industry, while others work in the biomedical and environmental sciences.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in chemistry.

1ST YEAR LEVEL COURSES

- CEM1000W - Chemistry 1000 (or equivalent)
- MAM1000W - Mathematics I (or equivalent)
- PHY1031F - General Physics A
- PHY1032S - General Physics B

2ND YEAR LEVEL COURSES

- CEM2007F - Physical Chemistry & Spectroscopy
- CEM2008S - Organic & Inorganic Chemistry



3RD YEAR LEVEL COURSES

- CEM3005W - Chemistry 3005

ELECTIVE COURSE

- CEM2013S - Chemistry in Health & Disease

CAREER OPPORTUNITIES FOR GRADUATES

Chemistry is a popular study choice at UCT as graduates are directly employable and the postgraduate degrees are in demand in industry. The versatility of the chemistry qualification is borne out by the fact that our graduates find employment in such diverse fields as energy (fossil fuels), agrochemicals, mining and minerals, pharmaceutical and medicinal industries (biotechnology, drug production and vaccines), polymers (plastics), food (quality control, wine and beer-making), computational chemistry and patent law.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Computer Engineering

Computer engineering is a discipline that integrates principles of electrical engineering and computer science for the purpose of developing computer systems. Computer engineers are typically involved with tasks such as writing software and firmware for embedded systems, designing VLSI chips (for SoC devices), interfacing sensors and actuators with microprocessors, designing circuit boards, and implementing special-purpose operating systems.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Computer engineering is best suited to creative thinkers who want to make physical electronic artefacts. Specifically, this field suits students that want to both build physical hardware, as in computer platforms or peripherals, and also want to develop algorithms and software that will run on the custom hardware. Consequently, computer engineers need a personality that handles frequent swapping from a realm of circuits, soldering and hardware construction, to the abstract paradigm of algorithms and programming.

WHAT COURSES WILL YOU TAKE?

(Computer Engineering is linked to the Computer Science major)

1ST YEAR LEVEL COURSES

- CSC1015F – Computer Science
- CSC1016S – Computer Science
- MAM1000W – Mathematics 1



2ND YEAR LEVEL COURSES

- INF2009F – Systems Development A
- EEE2040F – Basics of Electronic Engineering
- EEE2026S – Electrical Engineering
- CSC2001F – Computer Science
- CSC2002S – Computer Science

3RD YEAR LEVEL COURSES

- EEE3078W – Digital, Embedded and Adaptive Systems
- CSC3002F – Computer Science
- CSC3003S – Computer Science

CAREER OPPORTUNITIES FOR GRADUATES

There is an increasing demand for computer engineers in the workplace. These engineers can adapt to a variety of different vocations in which computers and electronics are instrumental to the operation of a business or system. Since a computer engineer has a thorough understanding of electronic and electronic systems, in addition to skills in computer science and information technology, these engineers are not limited to developing computing platforms – indeed, they tend to be well equipped to transition to more general computer-depend careers, such as designing and maintaining networks, database development and bespoke programming. Computer engineers can find work in such diverse fields as manufacturing, telecommunications, robotics, product development and transportation.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%); Physical Science 5 (60%) or Information Technology 5 (60%); NBT in Mathematics, AL & QL to be written



Computer Game Development

The Computer Game Development programme aims to give a deep understanding of the technical side of Computer Game Design, and a broad appreciation of the roles that others, such as animators, play in the design and creation of a successful game. Students undertaking this programme still complete a regular computer science degree and can thus serve in any role which requires a computer scientist.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Those wishing to obtain a computing degree which provides the core technical skills necessary to design and develop 2D and 3D computer games.

WHAT COURSES WILL YOU TAKE?

[Computer Game Development is linked to the Computer Science major]

1ST YEAR LEVEL COURSES

- CSC1015F – Computer Science
- CSC1016S – Computer Science
- MAM1000W – Mathematics 1

2ND YEAR LEVEL COURSES

- INF2009F – Systems Development A
- CSC2003S – Computer Games
- CSC2001F – Computer Science
- CSC2002S – Computer Science

3RD YEAR LEVEL COURSES

- CSC3020H – 3D and Distributed Game Design
- CSC300aH – Computer Science 300aH
- CSC3002F – Computer Science
- CSC3003S – Computer Science

CAREER OPPORTUNITIES FOR GRADUATES

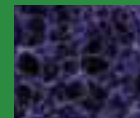
Graduates will be able to secure jobs within the computer games and visual effects industries, as well as in general information and communications technology companies. As you learn to program computer games you cover a large array of advanced topics in computer science, such as computer graphics and artificial intelligence, that are useful in domains beyond game development.



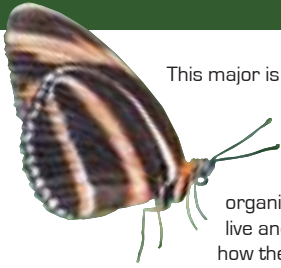
ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%); Physical Science 5 (60%) or Information Technology 5 (60%); NBT in Mathematics, AL & QL to be written



Ecology & Evolution



This major is about life on earth in all its forms - the adaptations of living

organisms: how they live and interact, and how they have come about. Ecology examines

how organisms interrelate with each other and with their environment. Evolution provides the mechanism by which organisms and communities are shaped. Together ecology and evolution explain and account for the patterns that make up the diversity of life that surrounds us. An understanding of the principles of ecology and evolution is essential in order to comprehend the intricacies of living systems.

The southern tip of Africa holds a treasure house of unusual plant and animal communities and provides exciting and special examples from which to learn about ecology and evolution. The courses use a mix of lectures, practical classes and field trips to prepare students who want to embark on a career in Ecology & Evolution.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Anyone who is in any way intrigued with the natural world around them.

A major in Ecology & Evolution will provide a framework for students taking either of the other life science majors, namely Applied Biology or Oceanography & Marine Biology. Ecology & Evolution will also be of special benefit to students studying Environmental & Geographical Science, enabling them to comprehend the subtleties of how human disturbance impacts on natural ecosystems and equip them with the background information required to determine how human-induced perturbations can be ameliorated.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Ecology & Evolution.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- BIO1004S - Biological Diversity
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004
- STA1007S - Bionumeracy

2ND YEAR LEVEL COURSES

- BIO2010F - Principles of Ecology & Evolution Two of
- BIO2013S - Life in the Sea
- BIO2012S - Life on Land: Plants
- BIO2011F - Life on Land: Animals

3RD YEAR LEVEL COURSES

- BIO3015F - Ecosystem Ecology
- BIO3016S - Systematics & Macroevolution

CAREER OPPORTUNITIES FOR GRADUATES

Graduates with a degree in Ecology & Evolution will be well prepared for careers with government institutes (e.g. SA National Parks; Cape Nature; SA National Biodiversity Institute), non-government organizations (e.g. World Wildlife Fund; Conservation International), and private companies (e.g. environmental agencies). Teaching is another career path.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Environmental & Geographical Science

Environmental & Geographical Science at UCT is an interdisciplinary major with focus on human-environment relations. It is an applied discipline with a focus on a range of skills associated with both the natural and social sciences.

The student is offered a sound theoretical and practical training in subjects that foster an integrated approach to the study of the complex relationship between society and the environment. The Department is committed to improving knowledge, understanding and management of the interactions between humans and their social, biological and physical life-support systems. With the aim to enhance or encourage the values conducive to the sustainability of these systems in the future.

The Department has a broad and interdisciplinary research portfolio. Focus areas include atmospheric science, climate-change science, quaternary environmental change, land degradation, integrated environmental management, urban issues, disaster risk science, social theory, discourses of development, food security and remote sensing.

WHO WOULD BE INTERESTED IN THIS MAJOR ?

The discipline is especially attractive to students who wish to learn about the connections and relationships that characterise the human-environment interface.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Environmental & Geographical Science as part of the BSc or BA degree.

1ST YEAR LEVEL COURSES

- GEO1009F - Introduction to Earth & Environmental Sciences
- EGS1003S - Geography, Development & Environment
- MAM1004F - Mathematics 1004 (BSc only)
- STA1000S - Statistics 1000 (BSc only)

2ND YEAR LEVEL COURSES

- EGS2013F - The Physical Environment
- EGS2014S - Contemporary Urban Challenges

3RD YEAR LEVEL COURSES

- Two of
- EGS3012S - Synoptic Climatology
- EGS3020F - Environmental Change & Challenge
- EGS3021F - Sustainability & the Environment
- EGS3022S - Geographic Thought

CAREER OPPORTUNITIES FOR GRADUATES

Studying in the field of environmental and geographical science may lead to career opportunities in a wide range of fields including amongst others environmental management, urban and regional planning, disaster risk mitigation and management, research in physical and human geography including climatology, education, community development, sustainability science and tourism.



ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%); Physical Science 5 (60%) or Life Sciences 5(60%); NBT in Mathematics, AL & QL to be written



Genetics

Students taking the Genetics major in the Department of Molecular & Cell Biology will be taught fundamental concepts in classical, molecular and evolutionary genetics. Classical Genetics is the study of heritability and variation in living organisms, whilst molecular genetics is concerned with understanding the structure and function of genes at the molecular level. Genomics considers the comparative study of genomes of living organisms. In the Genetics major at UCT emphasis is put on understanding the core biological processes of gene regulation and cell signalling in plants and animals, and integrating this knowledge into our understanding of disease, development and evolution.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Students with an interest in learning about the latest tools in molecular genetics and genomics, and applying them to problems in the life and health sciences. Students should have an enquiring mind and enjoy problem solving.

The Genetics major is suitable for students who wish to co-major in any of the following courses: Applied Biology, Ecology & Evolution, Biochemistry, Microbiology, or Physiology.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Genetics.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- BIO1004S - Biological Diversity
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004
- STA1007S Bionumeracy - Statistics 1000

2ND YEAR LEVEL COURSES

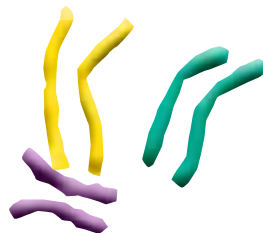
- MCB2018F - Introduction to Genetics
- MCB2019S - Eukaryotic Gene Regulation & Cell Signaling

3RD YEAR LEVEL COURSES

- MCB3019F - Recombinant DNA, Genomics & Proteomics
- MCB3023S - Molecular Evolutionary Genetics & Development
- MCB3012Z - Research Project

CAREER OPPORTUNITIES FOR GRADUATES

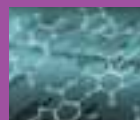
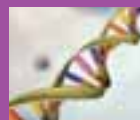
A qualification in Genetics will open up several career pathways to you. Universities require researchers, technicians and lecturers in a wide range of genetic-related fields. Genetics plays an important role in Medicine, and jobs are available in clinical molecular genetics, genetic counselling, research, molecular diagnostics and pharmacogenomics. In the agriculture, pharmaceutical and biotechnology industries, a training in Genetics is important for jobs in management, research, writing and reporting, marketing, sales and public relations. The government sector requires administrators, managers, and officers with knowledge of genetics for decisions in science policy, regulation, advice, legislation and awarding research grants. Other jobs include scientific publishing, patent law, gene and paternity testing, DNA forensics, and conservation.



ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Geology



Geology is the science of the Earth's origin, structure and composition. Geology is the basis for understanding the

Earth; how it evolved, what forces have shaped its oceans, mountains, rivers and lakes; how and where its resources are stored, how it first became a pleasant place for humans to live, and, more recently, how to manage and keep it so. The geology of South Africa is world-renowned and, in addition to some of the most important mineral deposits yet discovered, has many examples of rocks of extraordinary scientific importance. Geology has a long history of being studied at South African Universities and Geology graduates from South Africa have a very good reputation worldwide.

Geology offers a professional scientific career for men and women who are interested in discovering and developing the Earth's resources. It is a wealth-generating occupation essential to the economies of modern nations. Geology is a multi-faceted science, offering a wide variety of employment opportunities, working environments and the chance to visit unusual places. Many geologists are attracted into the subject through a love of the outdoors but there are equal opportunities for those who enjoy laboratory work.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Geology is for those who would like to be scientifically stimulated and become familiar with the most advanced analytical techniques, and at the same time appeals to those who enjoy an outdoor life. The salary and promotion prospects for geologists are good and at the same time often involve a combination of outside (field) and office work. This field work often takes place in remote parts of the world. The work done by geologists contributes significantly to the economy of Southern Africa and the upliftment of all of its people, but at the same time many geologists are involved in projects and research aimed at conserving our magnificent natural environment.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Geology.

1ST YEAR LEVEL COURSES

- GEO1009F - Introduction to Earth & Environmental Sciences
- GEO1006S - Introduction to Minerals, Rocks & Structure
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004F [or MAM1000W]
- STA1000S - Statistics 1000

2ND YEAR LEVEL COURSES

- GEO2001F - Mineralogy & Crystallography
- GEO2004S - Physical Geology
- MAM2052F - Quantitative Skills for Scientists
- GEO2005X* - Field Geology & Geological Mapping

3RD YEAR LEVEL COURSES

- GEO3005F - Petrology & Structural Geology
- GEO3001S - Stratigraphy & Economic Geology

* Field work course to be taken over second and third years of study

CAREER OPPORTUNITIES FOR GRADUATES

In recent years, geologists have been highly sought after by employers, both in South Africa and overseas. Geologists are employed by large mining or oil companies, by small private firms of geologists, within the civil service, or for quasi-governmental research institutions, or are self-employed as consultants. Many geologists are involved with engineering and/or environmental projects, including the search for water.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Human Physiology

The major in Human Physiology focuses on the structure and function of the human body. It begins with an introduction to human anatomy, covering the basic structure and function of cells, tissues, organs and systems. It includes a study of homeostasis, the cardiovascular, respiratory, digestive, excretory, reproductive and locomotor systems as well as the regulatory endocrine and nervous systems. In third year there is a strong emphasis on metabolism and exercise physiology during the first semester and a focus on neurophysiology in the second semester.

The Human Physiology major aims to provide an understanding of how the human body functions, how we learn new behaviour and how we change our behaviour. A series of practical and tutorial sessions are designed to develop technical skills, using computers to record and analyse muscle and/or brain function, as well as improving oral and writing skills.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

This course would be of interest to students with a desire to find out how the human body and brain function to promote and maintain life.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Human Physiology.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004

2ND YEAR LEVEL COURSES

- HUB2019F - Introduction to Human Biology
- HUB2021S - Human Biology: Regulation & Integration

3RD YEAR LEVEL COURSES

- HUB3006F - General & Applied Physiology
- HBU3007S - Biophysics & Neurophysiology
- Other major

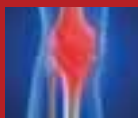
CAREER OPPORTUNITIES FOR GRADUATES

Ideally, an academic career, with the student going on to do BSc(MED)(HONS), MSc and PhD in physiology, eventually to become a researcher or to lecture, carry out research and publish research findings. Future specialisation need not be restricted to physiology. Armed with an in-depth knowledge of human structure and function, a student with a major in physiology would be able to pursue further studies in other medical fields, such as nutrition and dietetics, human genetics, medical biochemistry, immunology and pharmacology etc. Students who do not wish to pursue an academic path, could find employment as research assistants in health science laboratories or in industry. Knowledge of human physiology and the practical training obtained during the course will help to prepare a student for a position in companies that provide medical services, as a sales representative or consultant. Sports science which is also covered intensively in this course, offers a range of opportunities.

ADMISSION AND SUBJECT REQUIREMENTS

NSC: APS of 4/35

Mathematics 6 (70%) & Physical Science 5 (60%), NBT in Mathematics, AL & QL to be written



Mathematical Statistics

Mathematical Statistics is the scientific application of mathematical principles to the collection, analysis, and presentation of data. Statisticians contribute to scientific enquiry by applying their mathematical and statistical knowledge to the design of surveys and experiments; the collection, processing, and analysis of data; and the interpretation and presentation of the results.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Mathematical Statistics is a mathematical science, and so a taste and aptitude for mathematical thinking is a crucial ingredient. The field of statistics, like other areas of applied mathematics, often attracts those interested in the analysis of patterns in data: developing, understanding, abstracting, and packaging analytical methods for general use in other subject areas.

Statistics is also, by definition, an information science. Imaginative use of both computing power and new computing environments drives much current research - so an interest in computation and/or computer science can also be a start for a statistician.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Mathematical Statistics.

1ST YEAR LEVEL COURSES

- MAM1000W - Mathematics I
- STA1006S - Statistics for Mathematical Disciplines

2ND YEAR LEVEL COURSES

- STA2004F - Statistics 2004
- STA2005S - Statistics 2005

3RD YEAR LEVEL COURSES

- STA3041F - Statistics 3041
- STA3043S - Statistics 3043

CAREER OPPORTUNITIES FOR GRADUATES

One advantage of working in Statistics is that you can combine your interest with almost any other field in science, technology, or business. Statisticians are employed in many industries, including biology, finance, economics, engineering, medicine, public health, psychology, marketing, government, education and sports. In all of these areas and many others, statisticians work closely with other scientists and researchers to develop new statistical techniques, adapt existing techniques, design experiments, and direct analyses of surveys and retrospective studies.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Mathematics

1

2

3

4

5

Mathematics is the science of structure, quantity, change and space and the interactions between them. While mathematical ideas can be inspired by everyday observations, it is a characteristic feature of mathematical truth that it is derived with logical reasoning on the basis of sound definitions. Mathematics dates back to ancient times, but has undergone some of its most dramatic advances in the modern era. Nowadays it can be considered as one of the most successful collective human endeavours. Each day mathematicians all over the world prove hundreds of new theorems and solve numerous open problems and in this way they contribute to the systematic body of knowledge that comprises modern mathematics.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Students who are interested in mathematics and science in general and who are excited about analysing complex problems rigorously should seriously consider majoring in mathematics. While the ability and confidence to learn mathematics is required, even more important is a fascination with new ideas.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Mathematics.

1ST YEAR LEVEL COURSES

- MAM 1000W - Mathematics I
- MAM 1019H - Fundamentals of Mathematics

2ND YEAR LEVEL COURSES

- MAM 2000W - Mathematics II

3RD YEAR LEVEL COURSES

- MAM 3000W - Mathematics III

Many students major in both Mathematics and Applied Mathematics because there is considerable overlap in the requirements of the two majors and because this approach leads to the broadest possible range of career opportunities and the deepest possible understanding of mathematics in general. Other popular combinations are with computer science, physics and statistics.

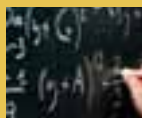
CAREER OPPORTUNITIES FOR GRADUATES

Mathematics is a popular subject among students. Mathematicians have excellent career opportunities and they are highly valued by employers for their problem solving skills and their ability in analysing complex and abstract problems. The fact that these skills are transferable and that mathematics is relevant to almost every aspect of modern life explains why mathematicians have a huge variety of job opportunities. Nowadays mathematicians work in research departments, engineering laboratories, observatories, software companies, in education, actuarial sciences, finance and many other fields.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Microbiology

Microbiology is often described as the study of organisms and agents too small to be seen clearly by the naked eye. This course is thus concerned with the study of micro-organisms, which include bacteria, viruses, fungi, algae and protozoa. These days, microbiology does not rely only on the use of microscopes, but includes studying microbial physiology, biochemistry and genetics, as well as microbial diversity and ecology. Micro-organisms come in many different shapes and sizes, and occur in almost every conceivable habitat. They are capable of living in extreme environments, such as at temperatures above 100 degrees C, and are very important in our daily lives as they are responsible for food spoilage as well as causing disease in humans, animals and plants. Microbes have many uses and can be manipulated to the benefit of society in the production of food, antibiotics and other useful products. Microbiology provides the basis for the fields of genetic engineering and biotechnology.

The course aims to introduce students to key concepts and techniques in microbiology and covers the following topics: prokaryote cell structure; bacterial growth and control; microbial diversity and taxonomy; microbial genetics; biotechnology; metabolic engineering; bioprocess biotechnology and kinetics.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

Microbiology is for anyone with a keen interest in the microbial world and the influence that microbes have on their environments, such as people with an interest in biology, microbial interactions with animal or plant hosts, medical students, physiologists, biotechnologists, food scientists, ecologists and environmentalists.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Microbiology.

1ST YEAR LEVEL COURSES

- BIO1000F - Cell Biology
- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004
- STA1007S - Bionumeracy

2ND YEAR LEVEL COURSES

- MCB2016F - Introduction to Microbiology
- MCB2017S - Microbial Biotechnology

3RD YEAR LEVEL COURSES

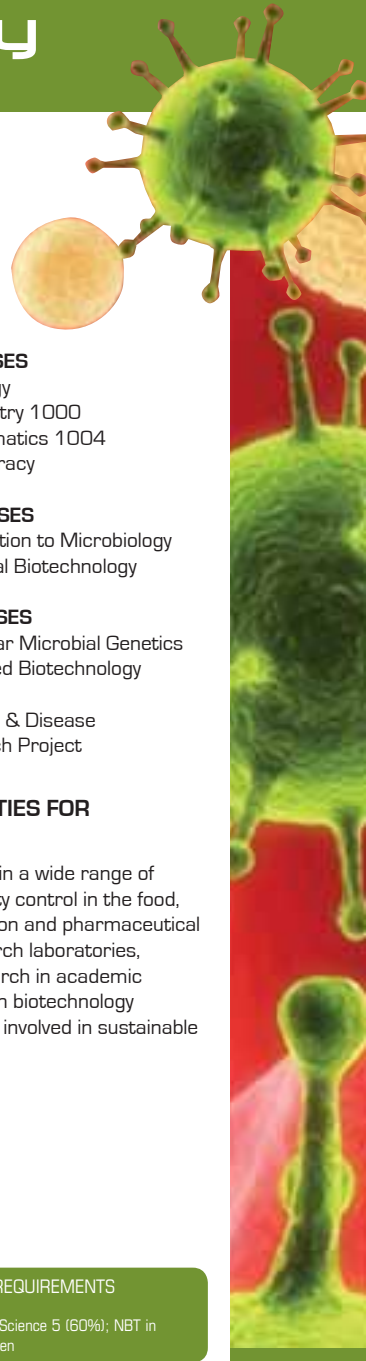
- MCB3021F - Molecular Microbial Genetics
- MCB3022S - Advanced Biotechnology
OR
- MCB3024S - Defense & Disease
- MCB3012Z - Research Project

CAREER OPPORTUNITIES FOR GRADUATES

Microbiologists can work in a wide range of areas, ranging from quality control in the food, beverage, water purification and pharmaceutical industries; medical research laboratories, research institutes; research in academic institutions; employment in biotechnology companies such as those involved in sustainable environment and biofuels.

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Oceanography & Marine Biology



This course deals with both the physical attributes of the oceans and of the organisms they accommodate. Oceanography covers the extent of the oceans, the physical, chemical and biological properties of sea water including salt and heat budgets, sea surface fluxes and ocean climatology. The principal forcing of the ocean is from the atmosphere and the responses of the sea to this produces the tides and many types of waves. Aspects of currents and water masses in the oceans of the world and coastal oceanography around South Africa provide the focus of regional oceanography and marine biology. Marine biology is the study of life in the sea.

The sea covers 71% of the planet, but it is the least well known of the environments on earth. An estimated 40% of marine species have yet to be discovered. Students will learn about the functioning of marine food webs and biochemical cycles in a variety of habitat types from tropical reefs to polar seas and from estuaries to the abyssal depths.

A third year course will focus on marine biological applications such as fisheries ecology, aquaculture, and marine conservation, which collectively provide the most employment opportunities for marine biologists. There will be field trips, tutorials and practicals in oceanographic instrumentation, ocean sampling and modern methods of analysis, biological sampling and experimentation and fisheries management.

WHO WOULD BE INTERESTED IN THIS PROGRAMME?

All students who are interested in the dynamics of the ocean functions and patterns of life in the sea, including its utilisation and conservation. With the new interest in global change, there are excellent opportunities to understand how the ocean plays an important role in keeping our wonderfully diverse and complex planet a sustainable environment for all.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in Oceanography and Marine Biology. Students are encouraged to take a co-major in either the biological sciences, or the earth and physical sciences.

1ST YEAR LEVEL COURSES

- CEM1000W - Chemistry 1000
- MAM1004F - Mathematics 1004
- STA1007S - Bionumeracy
- PHY1031F - General Physics A
- BIO1004S - Biological Diversity

2ND YEAR LEVEL COURSES

- SEA200aF - Principles of Oceanography
- BIO200dS - Life in the Sea

3RD YEAR LEVEL COURSES

- SEA300aF - Marine Systems AND
- SEA300bS - Dynamics of the Ocean & Atmosphere OR
- BIO300eF - Marine Ecology

CAREER OPPORTUNITIES FOR

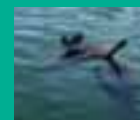
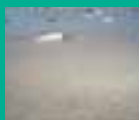
GRADUATES

Students graduating with a BSc degree with a major in Oceanography and Marine Biology, are well placed to study further at postgraduate level in either Marine Biology or Ocean and Atmosphere Science, or to join private industry firms, marine aquaculture farms, research establishments such as the Council for Scientific Research (CSIR), Marine and Coastal Management and Institute of Maritime Technology.

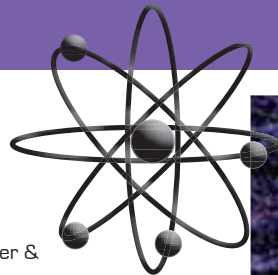
ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435

Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written



Physics



Physics.

1ST YEAR LEVEL

COURSES

- PHY1004W - Matter & Interactions
- MAM1000W - Mathematics I
- MAM1043H - Modelling & Applied Computing

2ND YEAR LEVEL COURSES

- PHY2014F - Waves & Electromagnetism
- PHY2015S - Classical & Quantum Mechanics
- MAM2000W - Mathematics II
(or MAM2004H + MAM2046W - Mathematics 2001 + Applied Mathematics)

3RD YEAR LEVEL COURSES

- PHY3021F - Advanced Physics A
- PHY3022S - Advanced Physics B

CAREER OPPORTUNITIES FOR GRADUATES

The BSc degree in Physics does not limit you to a career as a research physicist. Physics graduates develop a range of marketable skills such as intellectual rigour, technical and systems problem solving skills, mathematical abilities, computer literacy, experimental techniques, data analysis capabilities and the ability to communicate scientific ideas clearly. With a BSc degree in Physics you might find employment in industry, mining, construction, telecommunications, electronics; commerce:

ADMISSION AND SUBJECT REQUIREMENTS

NSC; APS of 435
Mathematics 6 (70%) & Physical Science 5 (60%); NBT in Mathematics, AL & QL to be written

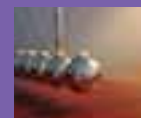
Physics is about understanding the nature of matter and radiation in the language of mathematics, and as such is a central fundamental discipline in science. A major in Physics teaches you how to apply your knowledge of fundamental principles in a range of contexts. Applications of the principles of physics are everywhere: transistors, computers, optical fibres, quantum computing. Physicists discovered the structure of DNA and the genetic code, and invented X-ray machines and the World Wide Web. Today they are looking at the fabrication of nano-scale smart materials and alternative energy sources. In mining, the biggest industry and employer in South Africa, much of the cutting-edge research and development in alternative methods of processing involve physicists. The precipitous nature of technological development, now more than ever, requires applied physicists to bridge the gap between engineering and pure physics in order to meet the demands of the technological world. With a major in Physics you can also pursue postgraduate studies in other disciplines, such as engineering, where the application of fundamental physics is greatly valued.

WHO WOULD BE INTERESTED?

If you are strong at mathematics and are interested in the ways in which nature can be understood then physics might be for you. Learning how to solve problems computationally is becoming an important aspect of our undergraduate physics programme.

WHAT COURSES WILL YOU TAKE?

The compulsory courses listed below must be included in your selection of courses for a major in



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Middle Campus
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Email: res@uct.ac.za

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Fax: (021) 650 5043
Email: sfa-finaid@its.uct.ac.za

Fees Office

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Middle Campus
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Fax: (021) 650 4768
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