

Interdisciplinary BSc degree-programmes

Applied Medicinal Chemistry / Biomedical Mathematical Sciences /
Biomathematics / Bioinformatics & Computational Biology

This programme leads to a BSc degree in one of the following four focal areas:

- Applied Medicinal Chemistry
- Bioinformatics and Computational Biology
- Biomathematics
- Biomedical Mathematical Sciences

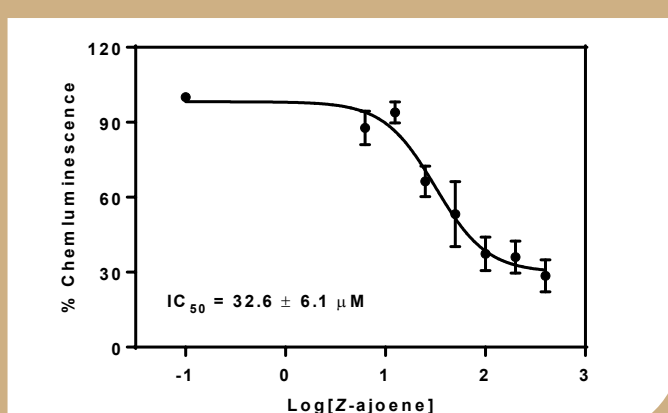
Each focal area has a distinctive curriculum allowing students to pursue interdisciplinary undergraduate studies, and thereafter possibly postgraduate studies, in the fields of engineering science or bioinformatics. Consult the Faculty of Science Yearbook for a detailed list of subjects.

Focal areas	Major/s
Applied Medicinal Chemistry	Chemistry & Physiology
Bioinformatics & Computation Biology	Combines Biochemistry, Bioinformatics, Computer Science and Genetics on a multidisciplinary level, with postgraduate study possibilities in Bioinformatics & Computational Biology, Computer Science or Genetics.
Biomathematics	Applied Mathematics and Biochemistry OR Biodiversity & Ecology
Biomedical Mathematical Sciences	Mathematics & Physiology

Do I qualify?

Minimum admission requirements

- Average (excluding Life Orientation): **65%**
- English OR Afrikaans
(Home Language or First Additional Language): **50%**
- Maths: **70%**
- Physical Sciences: **50%**



Focal areas explained:

Applied Medicinal Chemistry

The Medicinal Chemistry focal area provides a broad, multidisciplinary background in Chemistry and Physiology to prepare students for careers in the pharmaceutical, allied health and related industries. This focal area will develop your understanding of how diseases work, from their molecular basis, through the cellular level, to the effects on the body. You will also be equipped with chemical knowledge and skills that are essential for identifying, synthesizing, and developing novel treatments. This focal area leads to an honours programme in either Chemistry or Physiological Sciences.

Bioinformatics & Computation Biology

Bioinformatics and Computational Biology is a field that utilises computers to store, retrieve and analyse enormous volumes of biological data generated by highly parallelised methods used in modern biological research. The datasets can, for example, include the genome sequences of diverse organisms or human populations, the full protein complement of an organism or tissue, an extensive group of metabolites in a cell, or any other high-dimensional biological data set. Bioinformatics and Computational Biology is involved in studying biological questions using the data sets, designing databases to ease information access, or designing algorithms and software tools to analyse the data sets.

Biomathematics

There is a growing demand from fields such as molecular and systems biology, bioinformatics, and ecology for researchers with solid mathematical skills who can develop and analyse precise models for experimental data. Biomathematics is a broad interdisciplinary field where mathematical, statistical, and computing techniques are used to explain phenomenon and research problems within the biological, biomedical, and environmental sciences - from predicting the influence of HIV/Aids, malaria, and tuberculosis to the effects of climate change in South Africa.

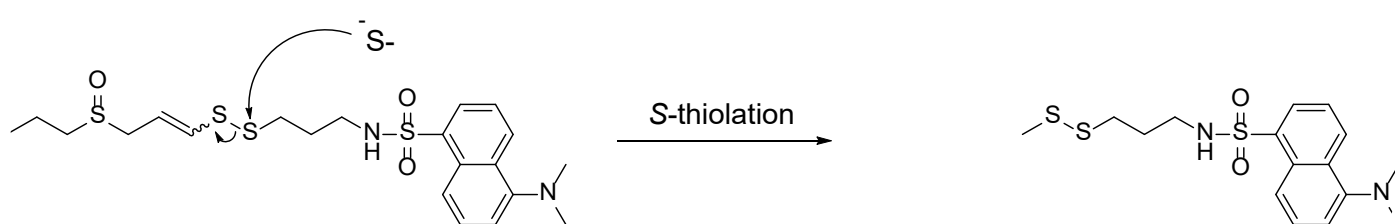
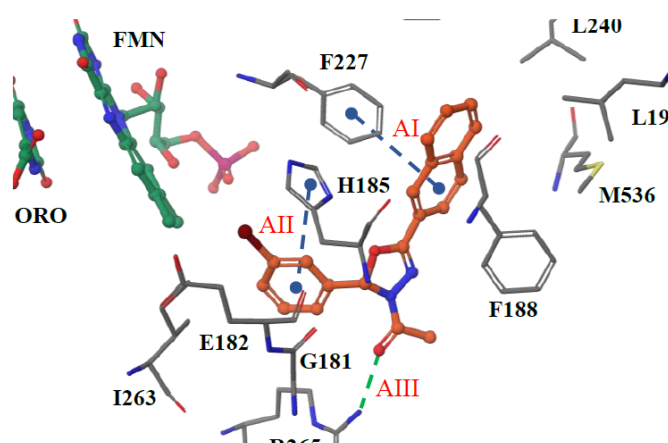
Biomedical Mathematical Sciences

This focal area will develop your abilities to undertake advanced reflection on and develop solutions for problems that require an integration of knowledge and skills from multidisciplinary fields such as engineering, mathematics, and the natural sciences. This focal area leads to an honours programme in Physiological Sciences or in Mathematics. It could also lead to a master's degree programme in Engineering Science and a PhD in Biomedical Engineering in the Faculty of Engineering.

Why study an interdisciplinary BSc degree?

The aim of the multidisciplinary Applied Medicinal Chemistry stream is to provide opportunities for students to study drug synthesis in chemistry, and also to educate them in the physiological and pathophysiology basis of diseases. This will equip them with the necessary knowledge for synthesizing novel targeted drugs and to test these in cell and animal models.

An interdisciplinary degree will open the door to a world of possibilities, provide you with a solid education in the pure and applied sciences, and equip you with transferrable skills.



What can I do with an interdisciplinary BSc degree?

Bioinformatics scientist
Biomedical engineer
Clinical trial associate
Data analyst

Data scientist
Medical epidemiologist
Personalised medicine analyst
Pharmaceutical scientist

Pharmacovigilance officer
Quality assurance specialist
Senior medicinal chemist

"It is a challenging, multidisciplinary course that focuses on the student's level of understanding rather than just absorbing and memorising information."

- undergraduate BSc student

Contact details

Department of Chemistry and
Polymer BSc Chemistry

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Website: <https://www0.sun.ac.za/chemistry/>

Contact our recruitment officer

Qaqamba Mhlauli

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Deadline for applications: 31 July

**General selection and
application criteria**

<https://www.sun.ac.za/english/maties>