Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

Science
EyeNzululwazi ngezeNdalo
Natuurwetenskappe

BSc Molecular Biology & Biotechnology

The subject areas of Biochemistry, Genetics and Microbiology together form the core of Biotechnology. Biochemists, geneticists, and microbiologists are like detectives that use Molecular Biology tools to unravel the exact functioning of microscopic cells, such as human and animal cells, yeasts, bacteria, fungi and viruses. This knowledge is then applied through Biotechnology to e.g. develop new drug targets, diagnostic tests for diseases, medicines, vaccines or exploiting plants and microbes for industrial use.

This programme gives you the background knowledge to understand the functioning of any living organism at the molecular level and lays the foundation for a career requiring knowledge and skills in Molecular Biology and its application in biotechnology.

Major/s

Combination of Biochemistry, Genetics, Microbiology.

Consult the latest Faculty of Science Yearbook (Part 5) for information on subjects and modules.

Do I qualify?

Minimum admission requirements to apply

- Average (excluding Life Orientation): **65%**
- English OR Afrikaans (Home Language or First Additional Language): **50%**
- Maths: **60%** or **70%** (depending on subject choice)
- Physical Sciences: **50%**

TAKE NOTE: The selection criteria used for admission are higher than this.

Majors Explained

What is biochemistry?

Biochemistry explores chemical and molecular processes related to living organisms. Biochemists study the structure, composition, and chemical reactions of substances in living systems and, in turn, their functions and ways to control or harness them. This allows Biochemistry to power scientific and medical discovery in a diverse range of human, animal, and plant research fields such as human and animal pharmaceuticals, forensics and nutrition.

What is genetics?

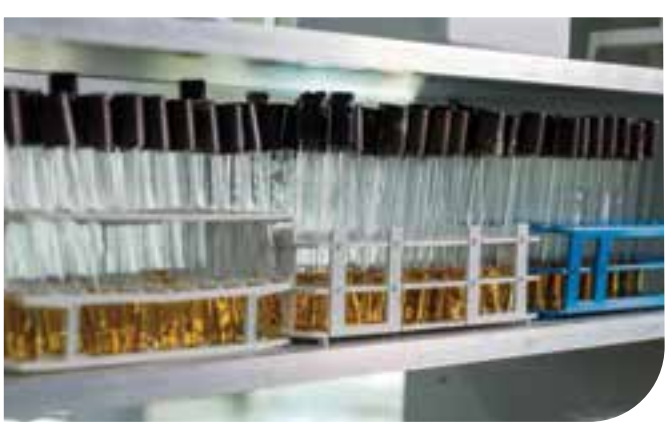
Genetics deals with the molecular structure and function of genes, gene behaviour in the context of a cell or organism (e.g. dominance and epigenetics), patterns of inheritance from parent to offspring, and gene distribution, variation, and change in populations. Given that genes are universal to living organisms, genetics can be applied to the study of all living systems, from viruses and bacteria, through plants and domestic animals, to humans.

What is microbiology?

Microbiology is the study of microscopically small living organisms such as bacteria, archaea, viruses, fungi, prions, protozoa, and algae. Although microbes are impossible to see with the naked eye, they make up 60% of all living matter on earth with a massive impact in every living organism on the planet. Microbial activities and interactions are vitally important to virtually all processes on earth, playing key roles in nutrient cycling, biodegradation, climate change, food spoilage, as well as the cause and control of disease. The science of microbiology aims to gain and expand our fundamental understanding of microorganisms by studying their morphology, metabolism, physiology, reproduction, and genetics, while others investigate their interactions with other organisms and role in ecology.

Why study BSc Molecular Biology & Biotechnology?

This field of study will allow you to make a positive difference in the world when applying your scientific skills to address real-world problems such as wastewater treatment, the adverse impacts of contraceptives, control of pathogens, assess the way in which patients respond to drugs or the discovery of new drugs for the treatment of debilitating diseases such as malaria, tuberculosis, and cancer. You will also be able to apply your skills in the agricultural sector and the food industry.



Why study BSc Molecular Biology & Biotechnology at Stellenbosch University?

The Departments of Biochemistry, Genetics and Microbiology strive to provide the best possible academically stimulating and enabling environment for students to be trained as future scientists and biotechnologists. We strive for the creative development of human resources to benefit the individual, the scientific, agricultural and medical communities, as well as broader society.

What can I do with a BSc Molecular Biology & Biotechnology degree?

Agricultural advisor
Biochemist
Biofuel developer
Biologist
Cosmetic developer
Food inspection analyst
Forensic scientist
Geneticist
Laboratory analyst
Laboratory technologist
Life sciences teacher
Microbiologist
Water quality expert

"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 Biochemistry
Tel: (021) 808 5861/2 **E-mail:** gdl@sun.ac.za
Website: https://www.sun.ac.za/english/faculty/science/biochemistry/

Department of Genetics
Tel: (021) 808 5829 **E-mail:** mja@sun.ac.za
Website: https://genetics.sun.ac.za/

Department of Microbiology
Tel: (021) 808 5847 **E-mail:** wendyw@sun.ac.za
Website: https://www.sun.ac.za/english/faculty/science/microbiology

Contact our recruitment officer

at science@sun.ac.za

Deadline: Apply with your grade 11 marks by 31 July

General admission and selection criteria

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

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BSc Molekulêre Biologie & Biotegnologie

Die vakgebiede Biochemie, Genetika en Mikrobiologie vorm saam die kern van Biotegnologie. Biochemici, genetici en mikrobioloë is soos speurders wat Molekulêre Biologie-instrumente gebruik om die presiese werking van mikroskopiese selle – dié van mense en diere, giste, bakterieë, swamme en virusse – te ondersoek. Hierdie kennis word dan deur middel van Biotegnologie toegepas om byvoorbeeld nuwe geneesmiddelteikens, diagnostiese toetse vir siektes, medisyne en entstowwe te ontwikkel, of om plante en mikrobes vir industriële gebruik te ontgin.

Hierdie program gee jou die agtergrondkennis om die funksionering van enige lewende organisme op molekulêre vlak te verstaan, en lê die grondslag vir 'n loopbaan wat kennis en vaardighede in molekulêre biologie, en die toepassing daarvan in biotegnologie vereis.

Hoofvakke

Kombinasie van Biochemie, Genetika, Mikrobiologie.

Raadpleeg die nuutste Jaarboek van die Fakulteit Natuurwetenskappe (Deel 5) vir inligting oor vakke en modules.

Voldoen ek aan die vereistes?

Minimum toelatingsvereistes om aansoek te doen

- 'n NSS-gemiddeld van 65% (Lewensoriëntering uitgesluit)
- Engels OF Afrikaans (Huistaal of Eerste Addisionele Taal) 50%
- Wiskunde 60% OF 70% (na gelang van jou vakkeuse)
- Fisiese Wetenskappe 50%

NEEM KENNIS: Die keuringskriteria wat vir toelating gebruik word, is hoër.

Meer oor jou hoofvakke

Wat is biochemie?

Biochemie ondersoek die chemiese en molekulêre prosesse wat met lewende organismes verband hou. Biochemici bestudeer die struktuur, samestelling en chemiese reaksies van stowwe in lewende en, op hul beurt, hul funksies en maniere om dit te beheer of te benut. Dit stel biochemici in staat om wetenskaplike en mediese ontdekkings in 'n diverse verskeidenheid menslike, diere- en plantnavorsingsvelde te dryf, soos farmaseutiese middels vir mense en diere, asook in forensiese ondersoeke en op die gebied van voeding.

Wat is genetika?

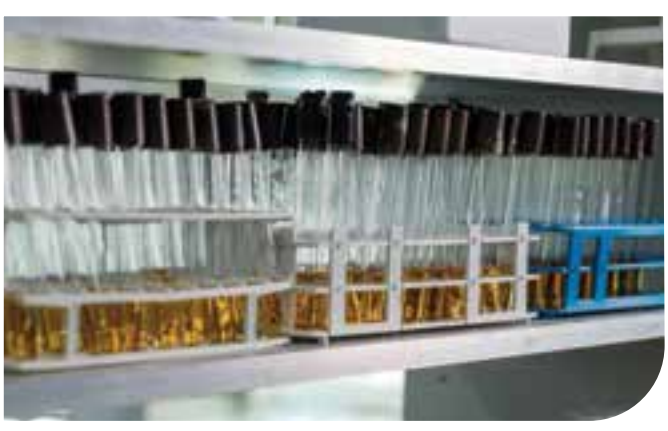
Genetika is gemoeid met die molekulêre struktuur en funksie van gene, geengedrag in die konteks van 'n sel of organisme (bv. dominansie en epigenetika), patrone van oorerwing van ouer na nageslag, en geenverspreiding, -variasie, en -verandering in populasies. Aangesien gene universeel is vir lewende organismes, kan genetika toegepas word op die studie van alle lewende sisteme, wat strek van virusse en bakterieë tot plante, huisdiere en mense.

Wat is mikrobiologie?

Mikrobiologie is die studie van mikroskopies klein lewende organismes soos bakterieë, archaea, virusse, swamme, prione, protosoë, en alge. Alhoewel dit onmoontlik is om mikrobes met die blote oog waar te neem, maak hulle 60% van alle lewende materie op Aarde uit met 'n massiewe impak op elke lewende organisme op die planeet. Mikrobiese aktiwiteite en interaksies is lewensnoodsaaklik vir feitlik alle prosesse op Aarde en speel sleutelrolle in voedingstofsiklusse, bioafbreking, klimaatsverandering, voedselbederf, asook die oorsaak en beheer van siektes. Die wetenskap van mikrobiologie het ten doel om ons fundamentele begrip van mikroörganismes uit te brei deur hul morfologie, metabolisme, fisiologie, voortplanting, en genetika te bestudeer, terwyl ander hul interaksies met ander organismes en hul rol in ekologie ondersoek.

Waarom BSc Molekulêre Biologie & Biotegnologie studeer?

Hierdie vakgebied sal jou in staat stel om 'n positiewe verskil in die wêreld te maak wanneer jy jou wetenskaplike vaardighede gebruik om probleme in die werklike wêreld te pak, soos die behandeling van afvalwater, die nadelige uitwerking van voorbehoedmiddels, die beheer van patogene, evaluasie van die manier waarop pasiënte op geneesmiddels reageer, of die ontdekking van nuwe middels vir die behandeling van aftakelende siektes soos malaria, tuberkulose en kanker.
Jy sal ook jou vaardighede kan gebruik in die landbousektor en die voedselbedryf.



Waarom by die Universiteit Stellenbosch studeer?

Die Departemente Biochemie, Genetika en Mikrobiologie streef daarna om studente die beste moontlike akademies stimulerende en bemagtigende omgewing te bied om hul as toekomstige wetenskaplikes en biotegnoloë op te lei. Ons streef na die kreatiewe ontwikkeling van menslike hulpbronne tot voordeel van die individu, die wetenskaplike, landbou, en mediese gemeenskappe, asook die breër samelewing.

Wat kan ek doen met 'n graad in Molekulêre Biologie & Biotegnologie?

Landbou-adviseur
Biochemikus
Biobrandstof ontwikkelaar
Bioloog
Kosmetiese produkontwikkelaar
Voedselinspekteur
Forensiese wetenskaplike
Genetikus
Laboratorium-analis
Laboratoriumtegnoloog
Lewenswetenskappe-onderwyser
Mikrobioloog
Waterkwaliteit spesialis

"Dit is 'n uitdagende multidissiplinêre kursus wat fokus op die student se vlak van begrip, eerder as die blote inneem en memorisering van inligting".
– Voorgraadse BSc-student

Kontak ons

Departement Biochemie
Tel: (021) 808 5861/2 **E-pos:** gdl@sun.ac.za
Webwerf: https://www.sun.ac.za/afrikaans/faculty/science/biochemistry

Departement Genetika
Tel: (021) 808 5829 **E-pos:** mja@sun.ac.za
Webwerf: https://genetics.sun.ac.za/

Departement Mikrobiologie
Tel: (021) 808 5847 **E-pos** wendyw@sun.ac.za
Webwerf: https://www.sun.ac.za/afrikaans/faculty/science/microbiology

Kontak ons werwingsbeampte

by science@sun.ac.za

Sperdatum: Doen aansoek met jou graad 11-punte teen 31 Julie

Algemene toelatings- en keuringskriteria

https://www.sun.ac.za/afrikaans/maties