Faculty of
Applied Science

Eduvos
Your Education. Your Future

Bachelor of Science in Biomedicine

SAQA ID 120718 NQF Level 7

Mode and duration

Contact
Full-Time (Campus)
- Minimum: 3 years
- Maximum: 5 years

Qualification description

The BSc (Biomedicine) degree prepares you for work in the dynamic and rapidly advancing world of biomedical science and technology.

This is an extremely demanding yet highly rewarding qualification. You will develop a broad theoretical foundation in human physiology, molecular biology, microbiology and pharmacology, with an emphasis on application-based research and the use of technology. You will cover a range of core modules such as Clinical Laboratory Haematology, Systems Pharmacology and Chemotherapeutics, Analytical Chemistry, Immunology, Biopharmaceutical Marketing, Medical Microbiology and Biotechnology. You will also cover subjects such as Clinical Trials and Good Manufacturing practice, Operations management for Biosciences, Economics of health care.

We offer you an environment that combines theory, research and practical application. In addition, we have excellent facilities such as science labs and quality lecture rooms. We ensure that you graduate with essential work skills such as critical and analytical thinking, effective problem-solving, collaborating in teams and communicating effectively.

Qualification accreditation

- Accredited by the Higher Education Quality Committee (HEQC) of the Council on Higher Education (CHE)
- Registered with the South African Qualifications Authority (SAQA)

This qualification is offered at the following campuses:

- Midrand

Entry requirements

1. South African National Senior Certificate (NSC) with Bachelor's degree endorsement.
2. Or a National Certificate (Vocational) level 4 issued by the Council of General and Further Education and Training with Bachelor's degree endorsement.
3. Or a letter or certificate confirming an exemption from Universities South Africa (USAf) for any other school-leaving results.
4. Or completion of a Bachelor's degree or equivalent.
5. Or completion of a relevant Foundation Programme along with a letter or certificate of exemption from Universities South Africa (USAf).
6. Or completion of a relevant Higher Certificate.
7. And 32 Eduvos points or more.
8. The points attained for the best two of the subjects of Biology/Life Sciences, Mathematics, Chemistry, Physics and Physical Science must be doubled.
9. And a minimum of 50% for Grade 12 or equivalent English Language.
10. And a minimum of 50% for Grade 12 or equivalent Biology/Life Sciences.
11. And a minimum of 50% for Grade 12 or equivalent Mathematics.
12. And a minimum of 50% for Grade 12 or equivalent Physical Science.

Applicable to Intake 1 and Intake 2 students:
- A student with less than 50% in Grade 12 or equivalent Mathematics, but greater than or equal to or equal to 40%, is required to enrol for and complete Mathematics for Science (FPSCA0) before attempting Mathematics for Science Students (SCMAA1).
- A student with less than 50% or without Physical Science in Grade 12, is required to attend and complete the tutorial classes offered for Introduction to Chemistry and Physics for Science Students concurrently with the respective first year modules.

Applicable to Intake 3 and Intake 4 students:
- And a minimum of 50% for Grade 12 or equivalent Physical Science.
- Or completion of the Eduvos BSc Applied Science Access Programme.

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Qualification structure

Year 1

Students are introduced to the basic principles of Biomedicine and Science.

- Animal and Plant Biology
- Applied Chemistry
- Bioentrepreneurship
- Computer Skills
- Introduction to Chemistry
- Laboratory Management
- Mathematics for Science Students
- Medical Bioethics and Communication
- Physics for Science Students
- Principles of Biology
- Quantitative Techniques (Biology)
- Science Skills

Year 2

Students will develop an intermediate level of knowledge in the following fields:

- Anatomy and Physiology 1
- Anatomy and Physiology 2
- Biopharmaceutical Sales and Marketing
- Clinical Laboratory Hematology
- Economics of Healthcare
- Exploration of Industry
- Histology
- Introduction to Microbiology
- Introduction to Molecular Biology
- Medical Microbiology and Immunology
- Nutraceuticals and Functional Foods

Year 3

On completion of this level, the students will have acquired a rounded knowledge in the following fields:

- Analytical Chemistry
- Clinical Trials and Good Manufacturing Practice
- Criminalistics
- Medical Biotechnology
- Operations Management for Bioscience
- Principles of Pharmacology
- Protein Biochemistry and Proteomics
- Systems Pharmacology and Chemotherapeutics
- Work Integrated Learning (Biology)

Possible career options

The careers for you, as a Bachelor of Science in Biomedicine graduate, are varied and include:

- Clinical Research Assistant
- Entrepreneurship
- Medical Lab Technician
- Medical and Pharmaceutical Representative
- Pharmacovigilance
- Postgraduate Studies
- Procedural Assistant
- Quality Assurance
- Regulatory Affairs
- Research and Development
- Scientific Communications
- Technical Sales

N.B: Diagnostics laboratories require registration with the HPCSA, which can only be attained after a relevant postgraduate qualification.

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Module Descriptors

Year 1

Animal and Plant Biology
This module aims to introduce biological diversity, focusing on the evolution, classification, anatomy, physiology and ecology of the major phyla of the animal and plant kingdom.

Applied Chemistry
This module aims to impart you with the ability to become an active participant in the learning process using several logical reasoning frameworks, thereby stimulating critical reflection on fundamental ethical issues that relates to the study of biotechnology. Furthermore, it intends to enhance ethical knowledge, ethical sensitivity and ethical judgement based on a balanced overview of scientific perspectives and social consciousness.

Bioentrepreneurship
The aim of this module is to introduce science students to the basics of business and equip the students with an understanding of the world of business.

Computer Skills
The aim of this module is to provide practical use of computer applications to create, manage and format data by developing word-processing, spreadsheet and presentation skills in a Windows Operating System (OS) environment.

Introduction to Chemistry
This module aims to develop students' understanding of the basic/fundamental chemical principles and techniques within general chemistry and to develop practical and laboratory skills. The student should be able to apply these concepts to practical problems. This module will also serve as the basis for students' further development in the physical and biological sciences.

Laboratory Management
This module focuses on laboratory safety, the quality of the product/service delivery (to the internal and external customer) and the quality of organisation (systems and processes) in the laboratory environment. The purpose of this module is to provide students with a complete body of knowledge of laboratory safety, health, environmental and quality (SHEQ) management as a holistic approach to applying good laboratory principles. Students will acquire fundamental theoretical and practical knowledge regarding the principles of SHEQ, applying SHEQ and quality assurance principles and procedures, laboratory hazard identification and risk assessment, system documentation tools as well as good laboratory practices.

Mathematics for Science Students
This module aims to introduce mathematical techniques and prepare students to use mathematics confidently to solve problems, communicate and reason mathematically and make connections between mathematics and its applications in real world scenarios.

Medical Bioethics and Communication
This module aims to provide you with a description of the communication process. Thus, aiding in the identification and definition of components and fundamental approaches to interpersonal, public and organisational communications, in particular, relating to how you make yourself understood in interactions within the scientific context.

Physics for Science Students
This module aims to give an overview over the breadth of physics and instil an understanding while providing examples of the application of physics in science.

Principles of Biology
This module aims to introduce the cell as the elemental structural and functional unit of all living organisms.

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Module Descriptors

Quantitative Techniques (Biology)
This module aims to introduce statistical techniques and experimental design as applied to biological problems. The emphasis is placed on the selection and interpretation of tests, descriptive methods, tests of significance, linear regression, correlation and analysis of variance.

Science Skills
This module aims to develop a set of intellectual skills that are associated with processing information in any branch of science. It includes basic and integrated science skills that are necessary for applying the scientific method, an empirical method of acquiring reliable information about nature. This module also focuses on helping students appreciate other skills such as referencing and laboratory safety.

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Module Descriptors

Year 2

Anatomy and Physiology 1
This module aims to introduce students to mechanisms involved in the control of the functioning of the human body and related anatomy.

Anatomy and Physiology 1
This module aims to gain an understanding of the various organ systems – cardiovascular, defence, respiratory, blood, renal and digestive – in terms of their physiological functions as well as anatomical structures which enable the body to form an interrelated system. Important aspects such as the understanding of medical terminology and clinical symptoms of disorders associated with the various organ systems: cardiovascular, defence/immunological, respiratory, blood, renal, reproductive and digestive systems will also be focused on.

Biopharmaceutical Sales and Marketing
This module aims to provide the student with an understanding of how marketing influences segments of the healthcare environment.

Clinical Laboratory Hematology
The aim of this module is to:

- Demonstrate a good understanding of the principles of haematology.
- Demonstrate a good understanding of the key concepts of haematologic disorders.
- Demonstrate proficiency in laboratory techniques applied in the diagnosis and monitoring of diseases of the blood, bone marrow and immune tissues.

Economics of Healthcare
The aim of this module is to introduce you to fundamental concepts of economics and how these concepts have an influence on health and healthcare systems.

Exploration of Industry
This module aims to expose BSc Biotechnology Management and BSc Biomedicine students to the research component of these two degrees and to industrial site visits to have a better understanding of what the industry has to offer. In addition, the benefits of such exposure will extend to the student's career path and assist them to explore possible entry-level positions.

Histology
This module aims to enable you to:

- Demonstrate a good understanding of the various tissues found in the human body.
- Demonstrate a good understanding of principles of haematology both theoretical and practical.
- Demonstrate a good understanding of techniques used in cell and tissue preparation for visual analysis.

Introduction to Microbiology
This module aims to introduce students to the fundamentals of microbiology and the relationship between microorganisms and humans. After completion of this module, students should be able to collect, analyse, organise and effectively evaluate information as well as identify and solve problems using critical and creative thinking.

Introduction to Molecular Biology
This module aims to introduce you to the fundamentals of molecular biology and its applications.

Medical Microbiology and Immunology
This module introduces pathogenic microorganisms in relationship to disease states, routine and special medical procedures. The basic concepts of immunology are also explored.

Nutraceuticals and Functional Foods
This module aims to investigate the inner workings of the nutraceutical/functional food/supplementary industry, which represents a rapidly expanding segment of the nutrition and health market. At the end of this module, you should be able to demonstrate an understanding of how foods can be used to modify physiology and to recognise the social, cultural and regulatory issues governing the nutraceutical industry.

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Module Descriptors

Year 3

Analytical Chemistry
This module aims to enable you to develop a better understanding of the main methods and techniques used in analytical chemistry as well as its data analysis.

Clinical Trials and Good Manufacturing Practice
This module aims to provide students with a description and critical assessment of the major issues and stages of developing and producing a biopharmaceutical. The assignment components of the module will equip the student with the tools to function as an effective team member in the design and conduct of ethically sound clinical trials and the quality-assurance process associated with product development.

Criminalistics
This module aims to expose students to the criminalistics approach to crime scene investigation as well as introduce students to different types of forensic sciences.

Medical Biotechnology
This module aims to introduce students to the basic principles and applications of selected medical biotechnology fields and the profound effect that advances in these technologies is having on the health of modern-day society.

Operations Management for Bioscience
The Human Resource Management component of this module introduces the basic principles of operations management and the role of HR in the workplace. The Accounting component of this module introduces the basic principles of drawing up financial statements.

Principles of Pharmacology
This module aims to enable you to:

- Demonstrate an understanding of the general principles of pharmacotherapeutics of drugs affecting the cardiovascular, digestive and respiratory systems.
- Demonstrate an understanding of the general principles of pharmacotherapeutics of drugs administered in cancer and infections.

Protein Biochemistry and Proteomics
This module aims to enable you to develop a better understanding of the nature, structure, catalytic and kinetic properties of enzymes and their receptors.

Systems Pharmacology and Chemotherapeutics
This module aims to enable you to:

- Demonstrate an understanding of the general principles of pharmacotherapeutics of drugs affecting the cardiovascular, digestive and respiratory systems.
- Demonstrate an understanding of the general principles of pharmacotherapeutics of drugs administered in cancer and infections.

Work Integrated Learning (Biology)
This module aims to assist students in identifying relevant industries for their Work Integrated Learning (WIL) experience through the preparation of proposals and approaching potential employers.