UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Fakulteit Natuur- en Landbouwetenskappe
Lefapha la Disaense tša Tlhago le Temo

Bachelor of Science *Biochemistry*

Make today matter

Life at the cellular and molecular levels depends on the specific interaction and cooperation of many individual biomolecules. To understand life at a fundamental level, biochemists study the role of individual biomolecules and relate this function to its unique structure and its interactions with other molecules.

Challenges of global relevance, such as COVID-19, HIV/AIDS, malaria, tuberculosis, antimicrobial drug resistance and other human or animal diseases are addressed by using flow cytometry, biophysical analysis, protein crystallography, genome analysis, selective gene expression and metabolic profiles.

Biochemists can work in medicine, veterinary science, the food and pharmaceutical industries, agricultural research and many other fields.

First-year students are exposed to a range of biological, physical and mathematical science subjects to provide them with a firm scientific basis. In the second and third years, they delve deeper into biochemistry, combining theoretical lectures with appropriate practical studies to learn the principles and methodology of best biochemical practice. In the third year, the genome, transcriptome, proteome and metabolome of a living cell is studied and proteome analysis, crystallography, cell structure and function, enzymology and immunology are applied to understand the molecular basis of disease.

Ideally, biochemistry is combined with chemistry, genetics, human physiology, microbiology, plant science and zoology, which all include both theoretical and practical aspects. Students may choose elective modules related to their studies.

Who is the ideal candidate?

A candidate for the Bachelor of Science *Biochemistry* programme should be motivated, innovative, persistent, meticulous and curious about life.

What makes this programme unique?

This degree falls under the Department of Biochemistry, Genetics and Microbiology and provides a firm basis for a career in the life sciences.

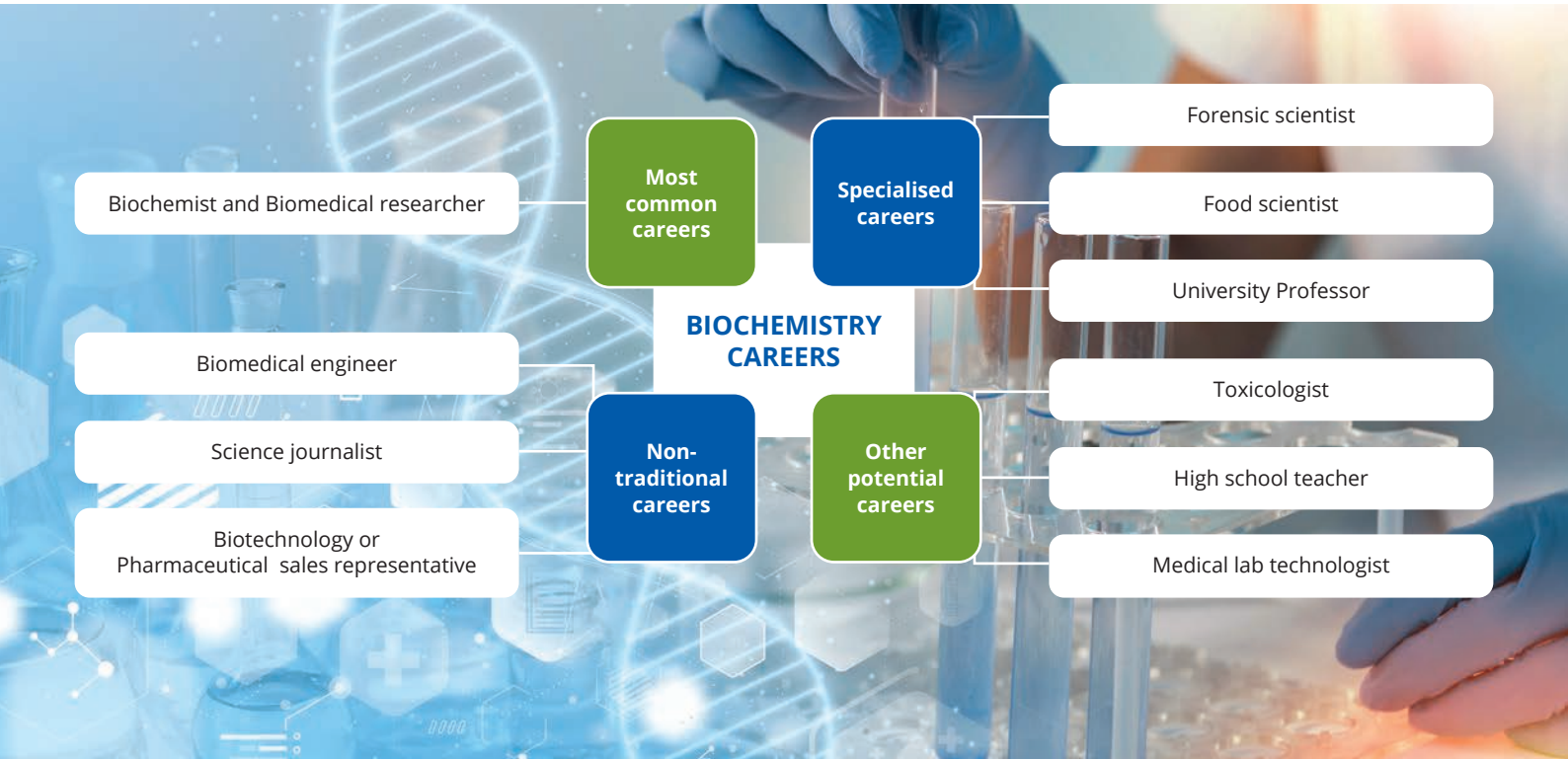
First-year students are exposed to a range of biological and physical science subjects to ensure a firm scientific basis. In the second and third years, they delve deeper into biochemistry, combining theoretical lectures with appropriate practical studies to learn the principles and methodology of research.

Ideally, biochemistry is combined with chemistry, microbiology, genetics, human physiology, plant science, zoology and/or food science.

Transferable skills gained while studying biochemistry include critical observation and analysis, project planning, report writing, time management, problem solving, logical thinking and computer literacy.

Career opportunities

Biochemistry offers many opportunities for exciting and challenging careers in medical research and in the food and pharmaceutical, fine chemicals and waste processing industries. Possible employers are academic institutions, research councils such as the Medical Research Council (MRC), the Agricultural Research Council (ARC), the Cancer Association of South Africa (CANSA) and the Water Research Commission (WRC), and applied research agencies such as the Council for Scientific and Industrial Research (CSIR) and forensic and pathology laboratories. Career opportunities include those of researcher, lecturer, teacher and medical representative. Graduates are comfortable in work environments such as universities, research institutes, pharmaceutical and biotechnology companies and related industries.



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(continued)

Make today matter

Which companies employ our graduates?

- Academic institutions
- Agribusiness companies
- Biomedical engineering environments
- Biotech-nological companies
- Cosmetic companies
- Food product development
- Forensic research
- Government
- Hospital laboratories
- Pharmaceutical companies
- Publishing companies
- Regulation companies
- Research institutions
- Sales and marketing firms

'I am fascinated by nature and science and could not have asked for a better degree. This incredible three-year degree gave me insight into how science and nature combine to produce something amazing.

I have also learnt how to recognise, understand and interpret key concepts, especially in the fields of biochemistry, genetics and microbiology. The skills and abilities acquired throughout the course have ensured that I will have access to career opportunities in industry and academia.

I am currently enrolled for postgraduate studies at UP and am involved in researching new ways to combat malaria.'

Henrico Langeveld – MSc *Biochemistry*

'The theoretical and practical aspects of this degree contributed to my intellectual development. What I enjoyed most about the course was the endless opportunities it offered to gain more knowledge by attending research seminars and annual symposiums. Using the knowledge of botany gained during my studies, I have started my own nursery at home.

I have also been able to put my knowledge of chemistry and biochemistry to good use and have started a chemicals company where household chemicals are produced. We are currently in the process of obtaining SABS approval for our products. My future plans include collaborating with other graduates to open our own pharmacy.

The broad scope of this degree provides the basis for a wide range of entrepreneurial ventures, but also qualifies graduates for good employment opportunities in companies that require the scarce skills developed by the programme.'

Meshack Kekana – MSc *Biochemistry*

Minimum admission requirements

Programme	Minimum requirements for NSC/IEB for 2025			
	Achievement level			APS
	English Home Language or English First Additional Language	Mathematics	Physical Sciences	
Bachelor of Science *Biochemistry* [3 years]	5	5	5	**32**

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Minimum requirements for applicants with a school leaving certificate not issued by Umalusi (South Africa)

Refer to the International undergraduate prospectus at www.up.ac.za/programmes > Undergraduate > Admission Information or click here for more information.

- The closing date for applications for programmes in this faculty is 30 June.
- Meeting the minimum admission requirements does not guarantee admission into a programme.

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES Programmes	Minimum requirements for 2025 Achievement level									
		GCSE #			AS Level	A Level	IB			
		The qualifications in the two columns below will be considered only for conditional admission. If final AS and/or A levels have been completed, these two columns will not apply. It can also not be used for final admission and/or registration.								
	Compulsory subjects	CIE IGCSE LGCSE BGCSE SGCSE O Level NSSC OL CGCE UCE NECO WAEC ZIMSEC	UK England Wales Northern Ireland	HIGCSE NSSC HL	GCE CIE NSSC AS	GCE CIE CGCE UACE WAEC ZIMSEC	IB SL	IB HL	KOMBI ABITUR	KCSE
Bachelor of Science *Biochemistry*	English Mathematics Physics Chemistry	C C C C	4 4 4 4	3 3 3 3	C C C C	E E E E	4 4 4 4	3 3 3 3	60-69% 60-69% 60-69% 60-69%	B B B B
Bachelor of Science *Biotechnology*										
Bachelor of Science *Ecology*										
Bachelor of Science *Zoology*										
Bachelor of Science *Entomology*										
Bachelor of Science *Genetics*										
Bachelor of Science *Human Genetics*										
Bachelor of Science *Human Physiology*										
Bachelor of Science *Human Physiology, Genetics and Psychology*										
Bachelor of Science *Medical Sciences*										
Bachelor of Science *Microbiology*										
Bachelor of Science *Plant Science*										
Bachelor of Science *Chemistry*										
Bachelor of Science *Physics*										
Bachelor of Science *Geography* [Option: Geography and Environmental Science]										
Bachelor of Science *Geoinformatics*										
Bachelor of Science *Geology*										
Bachelor of Science *Meteorology*										
Bachelor of Science *Environmental and Engineering Geology*										

Only English with at least a C symbol on this level can be used for final admission.
NOTE: The Faculty of Natural and Agricultural Sciences requires the following achievement levels for IELTS and TOEFL: TOEFL – Writing=22; Speaking=23; Reading=21; Listening=17
IELTS – Writing=6; Speaking=6; Reading=6; Listening=6

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		GCSE #			AS Level	A Level	IB			
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	Compulsory subjects	CIE IGCSE LGCSE BGCSE SGCSE O Level NSSC OL CGCE UCE NECO WAEC ZIMSEC	UK England Wales Northern Ireland	HIGCSE NSSC HL	GCE CIE NSSC AS	GCE CIE CGCE UACE WAEC ZIMSEC	IB SL	IB HL	KOMBI ABITUR	KCSE
Bachelor of Science *Food Science*	English Mathematics Physics Chemistry	C C C C	4 4 4 4	3 3 3 3	C C C C	E E E E	4 4 4 4	3 3 3 3	60-69% 60-69% 60-69% 60-69%	B B B B
Bachelor of Science in Food Management [Option: Culinary Science]										
Bachelor of Science in Food Management [Option: Nutrition]										
Bachelor of Science in Agriculture in Agricultural Economics and Agribusiness Management										
Bachelor of Science in Agriculture in Animal Science										
Bachelor of Science in Agriculture in Plant Pathology										
Bachelor of Science in Agriculture in Applied Plant and Soil Sciences										
Bachelor of Science *Actuarial and Financial Mathematics*	English Mathematics	C A	4 7	3 1	C A	E C	4 6	3 5	60-69% 80-100%	B A
Bachelor of Science *Mathematics*	English Mathematics	C B	4 5	3 2	C B	E D	4 5	3 4	60-69% 70-79%	B B+
Bachelor of Science *Applied Mathematics*										
Bachelor of Science *Mathematical Statistics*										
Bachelor of Consumer Science *Clothing Retail Management*	English Mathematics	C D	4 3	3 3	C D	E E	4 2	3 2	60-69% 50-59%	B C+
Bachelor of Consumer Science *Food Retail Management*										
Bachelor of Consumer Science *Hospitality Management*										

Only English with at least a C symbol on this level can be used for final admission.
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IELTS – Writing=6; Speaking=6; Reading=6; Listening=6