

Fakulteit Natuur- en Landbouwetenskappe Lefapha la Disaense tša Tlhago le Temo

# Bachelor of Science in 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 in 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.

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.



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 institutions, pharmaceutical and biotechnology companies and related industries.





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### Bachelor of Science in Biochemistry (continued)



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'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 – Master of Science specialising in 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 – Master of Science specialising in Biochemistry



#### **Minimum admission requirements**

	Minimum requirements for NSC/IEB for 2026						
	Achievement level						
Programme	English Home Language or English First Additional Language	Mathematics	Physical Sciences	APS			
Bachelor of Science in 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 <u>click here</u> 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.

	Minimum requirements for 2026									
	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.								
FACULTY OF NATURAL AND	Compulsory	CIE	UK		GCE	GCE	IB SL	IB HL	KOMBI	KCSE
	subjects		England	NSSC HL	NSSC	CGCE			ABILOK	
Programmes		BGCSE	Northern		~5	WAEC				
		EGCSE O Level NSSC OL CGCE UCE NECO WAEC WASSCE ZGCE	Ireland Pearson Edexcel GCSE			ZGCE				
Bachelor of Science in Biochemistry										
Bachelor of Science in Biotechnology										
Bachelor of Science in Ecology	]									
Bachelor of Science in Zoology	]									
Bachelor of Science in Entomology	]									
Bachelor of Science in Genetics										
Bachelor of Science in Human Genetics										
Bachelor of Science in Human Physiology										
Bachelor of Science in Human										
Physiology, Genetics and Psychology	English	С	4	3	С	Е	4	3	60-69%	В
Bachelor of Science in Microbiology	Mathematics	С	4	3	С	E	4	3	60-69%	В
Bachelor of Science in Plant Science	Physics Chemistry	C	4	3	C	E	4	3	60-69% 60-69%	B
Bachelor of Science in Chemistry	Chemisery		7	5	C	-	7	5	00 05 %	D
Bachelor of Science in Physics										
Bachelor of Science in Geography [Option: Geography and Environmental Science]										
Bachelor of Science in Geoinformatics										
Bachelor of Science in Geology										
Bachelor of Science in Meteorology										
Bachelor of Science in 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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FACULTY OF NATURAL AND AGRICULTURAL SCIENCES	Compulsory subjects	CIE UK	UK	HIGCSE NSSC HL	GCE CIE NSSC	GCE CIE CGCE	IB SL	IB HL	KOMBI ABITUR	KCSE
Programmes		O Level NSSC OL CGCE UCE NECO WAEC WASSCE ZGCE	Wales Northern Ireland Pearson Edexcel GCSE		AS	UACE WAEC ZGCE				
Bachelor of Science in Food Science										
Bachelor of Science in Food Management [Option: Culinary Science]	]									
Bachelor of Science in Food Management [Option: Nutritional Science]	English Mathematics Physics Chemistry									
Bachelor of Science in Agriculture in Agricultural Economics in Agribusiness Management		C C C	4 4 4	3 3 3	C C C	E E E	4 4 4	3 3 3	60-69% 60-69% 60-69%	B B B
Bachelor of Science in Agriculture in Animal Science		С	4	3	С	E	4	3	60-69%	В
Bachelor of Science in Agriculture in Plant Pathology										
Bachelor of Science in Agriculture in Applied Plant and Soil Sciences										
Bachelor of Science in 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 in Mathematics										
Bachelor of Science in Applied Mathematics Bachelor of Science in Mathematical	English Mathematics	C B	4 5	3 2	C B	E D	4 5	3 4	60-69% 70-79%	B B+
Statistics										
Bachelor of Consumer Science specialising in Clothing and Retail Management	English Mathematics	C D	4 3	3 3	C D	E	4 2	3 2	60-69% 50-59%	B C+
Bachelor of Consumer Science specialising in Food Management										

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									•	
FACULTY OF NATURAL AND AGRICULTURAL SCIENCES	Compulsory subjects	CIE	UK	HIGCSE NSSC HL	GCE CIE	GCE CIE	IB SL	IB HL	KOMBI ABITUR	KCSE
Programmes		O Level O Level NSSC OL CGCE UCE NECO WAEC WASSCE ZGCE	Wales Northern Ireland Pearson Edexcel GCSE		AS	UACE WAEC ZGCE				
Bachelor of Science in Mathematics [4-year programme]	English Mathematics	D C	3 4	3 3	D C	E	2 4	2 3	58% 65%	B- B
Bachelor of Science in Chemistry [4-year programme] Bachelor of Science in Geoinformatics	-									
[4-year programme]   Bachelor of Science in Geology   [4-year programme]   Bachelor of Science in Meteorology   [4-year programme]										
Bachelor of Science in Physics [4-year programme]	English Mathematics	D	3	3	D	E	2	2	58% 58%	B- B-
Bachelor of Science in Ecology [4-year programme]	Physics Chemistry	D	3	3	D	E	2	2	58%	в- В-
Bachelor of Science in Human Physiology [4-year programme]										
Bachelor of Science in Agriculture in Applied Plant and Soil Sciences [5-year programme]										
Bachelor of Science in Agriculture in Plant Pathology [5-year programme]										

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