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

BSc (Mathematics) and BSc (Applied Mathematics)

Mathematics, which originated from arithmetic and geometry, is based on patterns and structures and is the fundamental language of science and technology. Applied mathematics is concerned with the modelling and treatment of real-life problems in a variety of fields, such as engineering, finance, statistics, physics and biology. The power of mathematics and applied mathematics lies in their abstract, analytical and computational nature. Nowadays, mathematics is essential for all technological, financial and managerial industries, which form the backbone of the South African economy.

BSc (Mathematics)

Compulsory subjects are:

- Analysis
- Abstract algebra
- Geometry (third-year level)
- Calculus
- Linear algebra
- Differential equations
- Discrete structures (second-year level)
- Mathematical modelling
- Mathematical statistics
- Numerical analysis
- Dynamical processes (first-year level)

BSc (Applied Mathematics)

Compulsory subjects are:

- Analysis
- Continuum mechanics
- Numerical analysis
- Partial differential equations
- Dynamical systems (third-year level)
- Calculus
- Linear algebra
- Discrete structures
- Differential equations (second-year level)
- Mathematical modelling
- Mathematical statistics
- Dynamical processes (first-year level)

Who is the ideal candidate?

Mathematics students who enjoy the course and excel in it are those who enjoy solving problems and have a strong background in the basics of the subject.

What makes this programme unique?

The Department of Mathematics and Applied Mathematics is not only one of the largest departments on the Hatfield Campus, but also one of the largest mathematics departments in the country, with approximately 17 500 student enrolments for mathematics modules. The Department prides itself on excelling in teaching and research, as well as in community-based activities.

The diverse and competent staff has expertise in various fields. The Department regularly hosts international visitors and its researchers frequently travel abroad to attend conferences and pay research visits. No fewer than 31 of its researchers have received NRF ratings in fields ranging from more traditional abstract analysis to contemporary epidemiology, where the modelling of biological phenomena leads to exciting options.

A degree in mathematics trains students to apply, evaluate and adapt existing problem-solving techniques, or to develop new mathematical models and techniques to solve problems stemming from natural, technological and financial phenomena.

What career opportunities exist for graduates?

Graduates in mathematics and applied mathematics are employed by research institutions, in education (universities and schools), the public sector (government and medical institutions) and the private sector (engineering companies, financial institutions and the computer industry).

The training of these graduates in abstract, analytical and computational thinking provides them with the versatile background required to easily adjust to changing circumstances in the professional environment and to construct mathematical models of natural, technological and financial phenomena. Mathematicians and applied mathematicians apply, evaluate and adapt existing problem-solving techniques or develop new techniques to solve those problems.

Which companies employ our graduates?

A BSc (Mathematics) or BSc (Applied Mathematics) degree is a solid foundation for a professional career in many fields. Many of our graduates are employed by the banking and financial sector, but also in new fields like bioinformatics, genetics, management consulting, weather forecasting, etc. As there is a general shortage of mathematicians in South Africa, top performing students opt for further studies and an academic career.

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'In the past century we have witnessed a previously unimaginable increase in our knowledge and understanding of the world, which was largely driven by the progress made in the field of mathematics and the related sciences. As a result, there is almost no modern field of knowledge that can confidently claim truth without, in one way or another, bringing mathematics into the picture.

The fundamental relationship between mathematics and human understanding makes mathematics a cornerstone of science and ensures that it will continue to drive progress in the future. The past four years trained me in understanding ideas conceptualised by the minds that shaped our history and put me on the path to one day make my own contribution to the collective body of knowledge.

For someone like me, who believes in the pursuit of knowledge and truth, the opportunities and mentorship given to me during my studies by the Faculty are of immense personal value. I will always be indebted to the staff here, and it is an honour to have received my degree from the Department of Mathematics and Applied Mathematics at the University of Pretoria.'

– Adriaan de Clercq: BScHons (Mathematics) graduate 2020

'Pursuing a degree in mathematics taught me much more than just how to apply theorems and solve imposing equations! It taught me how to look at life from a different perspective and how to think about things in a fundamentally abstract manner, which few are able to do. The past three years have taught me to think logically and solve complex problems I never thought I would understand. If anything, this degree has given me an even deeper appreciation of the beauty of mathematics and has opened the doors to a bright future as a researcher or a professor teaching the subject.'

– Michelle Jacobs: BSc (Mathematics) graduate 2020

'In my opinion Math is beautiful in all aspects, so being part of the programme was really an outstanding move for me. The programme taught me a lot, choosing between multiple strategies for solving a problem which goes down to the saying "there are many ways to skin a cat" and a high order reasoning, which are skills that are relevant to today's world.'

– Kefentse Dipudi: BSc (Mathematics) graduate 2020

Minimum admission requirements

Programme	Minimum requirements for NSC and IEB for 2022		
	Achievement level		APS
	English Home Language or English First Additional Language	Mathematics	
BSc (Mathematics) **BSc (Applied Mathematics)** [3 years] Closing dates: SA – 30 September, Non-SA – 31 August	5	6	**34**