



UNIVERSITY OF  
KWAZULU-NATAL™

INYUVESI  
YAKWAZULU-NATALI

# School of Mathematics, Statistics and Computer Science

**College of Agriculture, Engineering  
and Science**

**INSPIRING GREATNESS**



**DON'T ACCEPT WHAT IS,  
ALWAYS ASK WHAT IF.**

UKZN's School of Mathematics, Statistics and Computer Science is one of five Schools in the College of Agriculture, Engineering and Science. It is located predominantly on the Pietermaritzburg and Westville campuses, with an Engineering service presence on Howard College. It has a staff complement of 73 academic, 10 support and 6 technical staff; houses approximately 900 undergraduate students; and boasts a postgraduate complement in excess of 210, engaged in Honours, Masters, PhD and Postdoctoral research. The School's cutting edge laboratories and research equipment compare favourably with the best in the world. Caring and enthusiastic lecturers ensure that students emerge highly employable, with a rich university experience and a first class degree in Mathematics (Pure or Applied), Statistics, Computer Science or Data Science to their name.

### **AREAS OF SPECIALISATION**

Mathematics is the language all scientists use for communication. It is an essential tool for modelling and solving concrete problems in the worlds of science, engineering, information technology, finance and medicine. Possessing a degree with a large proportion of mathematics modules sets you apart from the masses. It shows that you have the ability to quickly understand new abstract concepts and formulate scientific arguments as well as the ability to problem solve.

Statistics is the study of how to collect, analyse and interpret data. By employing theories of probability, statistics is used as a scientific tool for rational decision-making in almost every facet of modern scientific, social and economic life. Statisticians provide crucial guidance in determining what information is reliable and which predictions can be trusted. Most valuably, statisticians are able to predict future outcomes of events with varying levels of uncertainty, by fitting mathematical models to large data sets.

Technological advances dominate our world – all of which are driven by computer technology. As a result, it is one of the fastest growing areas of employment. Computer Science at UKZN covers both the theoretical and applied areas of the discipline and produces graduates who are able to introduce and develop new computational solutions and technologies.



Research in the School covers a variety of topics in Pure and Applied Mathematics, Statistics and Computer Science.

**Areas of specialisation include:**

- Applied Statistics
- Artificial Intelligence
- Astronomy and Astrophysics
- Biostatistics
- Data Science
- Differential Equations
- Financial Mathematics
- Mathematical Biology
- Mathematics, Statistics and Computer Science Education
- Numerical Analysis
- Theoretical Fluid Dynamics
- Theoretical Statistics
- Topology

## DEGREES OFFERED

### Undergraduate

- **Bachelor of Science**

UKZN's School of Mathematics, Statistics and Computer Science offers a three-year undergraduate course leading to the degree of Bachelor of Science (BSc). This may be achieved in two ways:

- Through a general and flexible BSc (Mathematics Stream) with possible major subject combinations of any two of the following: Applied Mathematics, Computer Science (a double major is possible), Pure Mathematics, Statistics and Data Science.
- Through a specific focused BSc, which has a more directed outcome:
  - Computer Science & Information Technology
  - Financial Mathematics

**Minimum entrance requirements:**

- NSC degree pass with Maths at level 5 and English, Life Orientation and Agricultural Science/ Life Science/ Physical Science at level 4.
- Admission points required: 30-48 (highest scoring students taken first).
- The closing date for applications is 30 September.

### Postgraduate

- **Bachelor of Science (Honours)**

A one- year specialist programme leading to an Honours degree. Applicants must have a relevant 3-year or equivalent qualification to be considered for Honours. Spaces are very limited and a careful selection process is followed. The closing date for applications is 30 September.

- **Master of Science**

A Master of Science programme is offered, whereby students engage in research under the supervision of an academic staff member. Entrance is decided by the track record of the student and the availability of a suitable supervisor. This degree takes a minimum of one year. The application date is open.

- **Doctor of Philosophy**

A Doctor of Philosophy programme is offered where students engage in new and original research supervised by academic members of staff. This is typically two to four years of study and normally follows on from a Master of Science Degree. The application date is open.

- **Postdoctoral study**

Remunerated, postdoctoral research positions are available on application.

Visit <http://caes.ukzn.ac.za>

## CAREER OPPORTUNITIES

Mathematicians, Statisticians and Computer Scientists are highly valued for their problem-solving ability. To be a Mathematician, a Statistician or a Computer Scientist one needs strong mathematical skills, an enquiring mind, good powers of observation, practical ability, the adaptability to learn new skills throughout one's career, and the social skills necessary to share one's ideas with colleagues. These skills all make graduates from UKZN's School of Mathematics, Statistics and Computer Science highly employable. In fact, a degree incorporating any discipline from the School prepares you for employment in just about any area.

An MSc (preferably a PhD) in any of the disciplines equips students with the necessary skills to undertake research in that discipline and follow (amongst others) an academic career. Such qualified individuals are highly sought after in research and academic institutions nationally and internationally.

### Mathematics

Mathematicians are found in such diverse fields as scientific design, research and development, statistical work, teaching, management services, computing, engineering, economics, and data analysis.



### Employment opportunities exist in:

- Financial Institutions
- Consulting Firms
- Research Institutions
- Computer Software Firms
- Communication Service Providers
- Energy and Petroleum Companies
- Stock Market
- South African Astronomical Observatory
- Industries related to the Square Kilometre Array (SKA)

### Statistics

Statisticians are highly sought-after in a wide array of fields, e.g. they work in banking, helping to create new products to predict how future financial markets will perform; they are employed by education institutions to analyse and interpret quantitative information; they are found in business and industry where they are responsible for business intelligence, i.e. the science of analysing the data of the company in order to maximize the potential of the company. All over the world, graduates with qualifications in statistics are amongst the most employable job seekers, thus making statistics one of the most scarce and sought after skills in many countries.

- **A Medical Statistician** collaborates with experts in medicine to clarify research issues and quantify their effects.
- **A Biostatistician** is involved with research support work in medical research organisations and institutions and public health departments. Work involves designing studies and clinical trials to answer specific questions regarding intervention and treatment strategies.
- **A Financial Mathematician**, also known as a quantitative analyst, is responsible for the hedging of financial risks and the management of investment portfolios.
- **A Biometrician** advises agricultural researchers or farmers, dealing with phenomena that affect animals' nutrition and breeding, plant breeding, crop production, etc.
- **A Statistician in the Banking World** helps create new products and predicts how the financial markets are going to perform in the near future.

### Computer Science

In the modern age of information technology explosion, a computer science graduate is instantly employable in a variety of fields.

- **A Computer Programmer** develops the instructions and languages computers use to operate. Programmers take the designs of software engineers and turn them into functional computer instructions that make up a programme.
- **A Database Developer and/or Administrator** is responsible for designing, maintaining, and using files to store customer and business information.
- **A Systems Analyst** plans and manages the design and implementation of computer systems to meet business requirements. As such systems analysts provide an interface between computer specialists and other facets of industry.
- **A Network Systems Analyst** designs and implements various types of computer networks to meet business needs. Owing to frequent advancements in computer technology this is a rapidly changing field, constantly providing the network systems analyst with new challenges.

### Data Science

Recent research indicates that demand for Data Scientists is booming and is only likely to increase in the next decade as companies move towards digital transformation, and big data, machine learning and data analytics become entrenched in businesses globally.

- **A Data Scientist** is the magician of today's big data era. Data Science involves the extraction and interpretation of knowledge and meaning from data. It is a multi-disciplinary field containing elements from statistics, information technology and computer science, operational research, optimisation and mathematics. Large companies need people who can make sense of massive amounts of data. Data Scientists find employment in financial institutions, consulting firms, research institutions, computer software firms, communication service providers and energy and petroleum companies amongst others.

## CONTACT DETAILS

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### **Handbook:**

For full course codes and information see the  
College of Agriculture, Engineering and Science handbook at  
<http://caes.ukzn.ac.za>

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