MATHEMATICS & APPLIED STATISTICS

UOW COURSES IN
PURE AND APPLIED MATHEMATICS / STATISTICS / FINANCIAL MATHEMATICS / MEDICAL MATHEMATICS / MATHEMATICS EDUCATION
Study at One of the World’s Best Universities

FIVE REASONS TO STUDY
MATHEMATICS & STATISTICS AT UOW

Mathematics is the basis for successful decision-making and problem-solving independent of sector or industry. Statistics is the study of the collection, organisation, analysis and interpretation of data.

Learn models to analyse and forecast results in areas as varied as economics, finance, health and industrial processes from internationally recognised and engaged academic staff.

1. LEARN FROM WORLD LEADING RESEARCHERS AND TEACHERS

The School of Mathematics and Applied Statistics has “above world standard” classification in the Excellence in Research for Australia rankings, and has staff that have won national awards for their teaching excellence. When you study at UOW you become part of a learning and research environment that is supported by highly qualified academic staff with expertise across a range of disciplines from pure to applied mathematics and statistics.

2. PROBLEM-SOLVING THAT APPLIES ACROSS ALL INDUSTRIES AND SECTORS

Mathematical and statistical models enable analysis and forecasting in many industries. You’ll learn problem-solving, critical thinking and analytical skills that are in demand across all government and private sectors. We have a range of courses, including those with flexibility and those with a strong industry focus, which are fully accredited by relevant professional bodies.

3. ACCESS OPPORTUNITIES AND SCHOLARSHIPS

We have a range of undergraduate scholarships, advanced degrees and Dean’s Scholar options. Our students are exposed to the latest thinking and ideas that will shape our global economy and future. Opportunities include scholarships from industry partners such as Tibra and Westpac, summer scholarships and undergraduate research projects with academic staff, access to programs of the Australian Mathematical Sciences Institute (AMSI) and inter-university courses via our Access Grid Room. High achieving students receive financial rewards as well as accelerated and more independent learning opportunities.

4. HIGH LEVEL OF EMPLOYABILITY AND STARTING SALARIES

Our students have excellent job opportunities and starting salaries. Our degrees are regularly reviewed by academics and industry experts to ensure students are prepared for the current workplace. As a Mathematics & Statistics graduate of UOW you will be able to choose to work in a wide range of business and government sectors.

5. HAVE MATHS, WILL TRAVEL

You will learn general skills that are widely applicable and easily transferable. For example, you will be able to find a problem, express it within the framework of the mathematical sciences, solve it using the most appropriate techniques (developing new techniques if necessary), then express the answer in such a way that it is comprehensible to people outside the mathematical sciences. Studying mathematics and statistics is a passport to work anywhere around the world.

WE’RE GOING PLACES

UOW is one of the best modern universities in Australia. We connect over 30,000 students from more than 130 nations to learn and discover. We’re young, we’re smart and we work hard enough to be ranked in the top 2% of universities in the world. Join us and see how far you can go.

YOU’RE IN CONTROL

Take control of your life like never before at UOW. Choose your degree. Choose a major. Choose elective subjects, and make exactly the study program you want.

THE TIME OF YOUR LIFE

Study where the brightest people take the time to learn your name. You’ll be more than a number at UOW, and be taught by world famous educators and researchers. Outside of class, you’ll be part of a campus culture defined by fun and friendship.
The critical thinking and problem solving skills I gained studying mathematics/statistics at UOW have been invaluable. My exposure to statistical software packages was also extremely useful. I learned that creating the figures is not enough. Allowing those figures to tell a story about the underlying data is where the power of statistics lies.

DR SARAH NEVILLE
Bachelor of Mathematics (Advanced) Honours Class 1, 2008
Doctor of Philosophy (Statistics), 2013
Acting Director, Technical Funding and Pricing Models,
Independent Hospital Pricing Authority (IHPP)

I get to put this into practice every day at the IHPP. We are tasked with calculating the National Efficient Price, which represents the average cost of public hospital activity, from a heart transplant to dialysis. This is used to improve the efficiency of the Australian public hospital system—something I find very rewarding.

BAChElor oF MaThEMaTICS / BACHELOR OF MaTHEMaTICS aDVANCED

Mathematics is the basis for successful decision-making and problem-solving across all sectors and industry fields. These include financial and insurance industries, environmental and biosecurity, energy and natural resources, environmental and public utilities, construction and manufacturing, retail and service industries, and public utilities.

WHAT YOU WILL STUDY

The Bachelor of Mathematics degree teaches highly transferable skills in problem solving, data analysis, probability and variability, mathematical modelling, logistics and logic. The degree is flexible, so you can take up to one third of your subjects from other disciplines to expand your career options.

Other opportunities include scholarships from corporate partners, summer scholarships and undergraduate research projects with academic staff, access to programs offered by the Australian Mathematical Sciences Institute (AMSI) and inter-university courses via our Access Grid Room.

The Bachelor of Mathematics Advanced is available to students who have superior mathematical knowledge on entry to UOW. For high school students, this means they have studied the highest level of mathematics possible. This elite degree offers a practically oriented program to high-achieving students, providing adaptability and career options.

You may specialise your degree by taking one of the following majors.

MATHEmATICS

go.uow.edu.au/bmath-math

The Mathematics major gives you quantitative skills that are in demand across all industries and serves as an initial preparation for employment as a professional mathematician. You will study subjects in applied mathematics, pure mathematics, and statistics.

Applied mathematics is the basis for successful decision-making and problem solving independent of sector or industry; it can provide new insights into nature, technology and business and create a pathway for innovative solutions. Applied mathematics underpins a wide range of scientific and commercial enterprises, providing extensive career options. Just about every industry depends at some point on handling and interpreting data, and on predicting and modelling outcomes. Mathematical results drive policy and innovation.

Pure mathematics is concerned with exploring patterns and solving problems; it can provide new insights into nature, technology and business and create a pathway for innovative solutions. Pure mathematics focuses on developing and analysing mathematical concepts and principles through deductive reasoning. A focus on pure mathematics is ideal for students who enjoy developing creative solutions to subtle problems and wish to explore the abstract and logical aspects of the discipline.

APPLIED STATISTICS

go.uow.edu.au/bmath-appstat

Statistics is the study of the collection, organisation, analysis and interpretation of data. Applied Statistics uses mathematical concepts and methods to develop, design and analyse scientific experiments, sample surveys, medical clinical trials, environmental studies, and industrial and business big data systems. It uses mathematical models of variation to enable analysis and forecasting in many industries. It is the basis for successful decision making and problem solving in government, business, science, engineering, agriculture and industry.

A major in Applied Statistics equips you with the essential skills and knowledge of a professional statistician: logic, problem solving, mathematical and statistical modelling, experimental design and the ability to organise, analyse and interpret large amounts of data. You will study subjects including: estimation and hypothesis testing, applied probability and financial risk, linear and generalised models, statistical inference and sample surveys and experimental design.

You will gain the essential skills and knowledge of a professional statistician: logic, problem solving, mathematical modelling, experimental design and the ability to manipulate, analyse and interpret large amounts of data.
Bachelor of Mathematics and Finance (Honours)

**WHAT YOU STUDY**

The Bachelor of Mathematics and Finance (Honours) teaches you the skills to apply sophisticated mathematical and statistical techniques to real world problems. You are also encouraged to develop computing and communication skills, which are assets in the job market.

Other opportunities include scholarships from corporate partners, summer scholarships and undergraduate research projects with academic staff, access to programs of the Australian Mathematical Sciences Institute (AMSI) and inter-university courses via our Access Grid Room.

**FINANCIAL PLANNING**

go.uow.edu.au/bmathfin-fp

This major is particularly applicable to those who wish to pursue a career within the financial services industry by gaining professional qualifications in the areas of providing financial planning and financial advice to clients. The areas of service provision are very wide including investment and asset portfolio construction and advice; superannuation, retirement and estate planning and associated services.

**MATHEMATICAL ECONOMICS**

go.uow.edu.au/bmathfin-me

Mathematical economics allows us to use mathematical principles and formulate to analyse problems in the economy. It enables us to conduct quantifiable tests and create models to predict future economic activity and economic behaviour.

**QUANTITATIVE CORPORATE FINANCE AND INVESTMENTS**

go.uow.edu.au/bmathfin-qcfi

Quantitative corporate finance and investment looks at the funding source and the capital structure of corporations. It examines tools and analysis utilised in corporate and business financial decision-making from a quantitative perspective. These decision processes may be short-term or long-term. Long-term decisions typically deal with the choice and type of corporate investments, sources of equity or debt funding and financial risk management. Short-term decisions mainly deal with working capital management of short-term assets and liabilities.

**RISK MANAGEMENT AND INSURANCE**

go.uow.edu.au/bmathfin-rmi

Risk management and insurance covers a wide range of activities including the assessing, quantifying, monitoring and mitigating of financial risk exposures for projects, companies and financial institutions. It also monitors compliance with relevant financial regulations. In particular, actuaries are professionals with strong mathematical backgrounds who deal with the financial impact of risk and uncertainty.

**CAREERS**

Mathematics and Finance graduates work in all areas of industry and government as risk managers, investment advisers, traders, financial analysts and more.

They work in all aspects of the finance sector from traditional banking to futures trading. Applied mathematics underpins a wide range of scientific and commercial enterprises, providing extensive career options. Just about every industry depends at some point on handling and interpreting data, and on predicting and modelling outcomes.

With the sophistication of modern finance products, leading edge banking and financial firms are hiring mathematicians to advance analytical and numerical techniques to price financial derivatives and manage portfolio risks.

Mathematical qualifications are essential in this environment—knowing the principles of finance is not enough. Bankers, investment managers, insurance companies and financial companies all rely on financial mathematics to survive and stay ahead of the competition.

The tools of mathematical analysis and prediction are essential to financial operations. This degree allows you to specialise your skills by selecting one of the majors above.

**MAJORS**

I really like how straightforward maths is, at its heart, there’s one right answer. There’s none of the equivocation you can get in other areas, and I think that’s just the way my mind works. Like a lot of kids, though, I don’t think I knew what you could do with it in high school. I was lucky that in my economics classes I got to see how it could be applied. It gives you something more to think about, being able to see how it works in the world.

At uni, having a maths background is a big advantage in finance subjects. When you understand the tools you’re using, they become much more versatile.

AUDI LI
Bachelor of Mathematics and Finance (Dean’s Scholar)
BACHELOR DEGREES

Bachelor of Mathematics Education

go.uow.edu.au/bmathed

Mathematics is a discipline central to many branches of science and commerce. Given its wide variety of applications, teaching the next generation of mathematicians requires specific skills. UOW Mathematics Education involves learning mathematics and how to teach it effectively.

WHAT YOU STUDY

During this four-year degree you will study a combination of maths and education subjects allowing you to practically apply both disciplines throughout your degree. Mathematics subjects including calculus, algebra, statistics and mathematical modelling are complemented with education subjects about teaching and learning strategies including learning and development, pedagogy (the method and practice of teaching), professional teaching skills, curriculum studies and meeting learners’ needs.

CAREERS

Nationally there is a shortage of quality secondary education teachers in the areas of Science and Mathematics. Scholarships in Maths and Science Education are available for high achieving students who can demonstrate positive motivation, interest and attitude towards high school teaching. See the NSW Department of Education & Communities website for details dec.nsw.gov.au.

Students are able to apply for an overseas Professional Experience placement in China, Malaysia, Fiji or Thailand where they are able to experience first-hand the education system and culture of another country.

ACCREDITATION

The Bachelor of Mathematics Education is recognised by most states and territories of Australia as well as the UK, Asia and Canada.

Mathematics is a discipline central to many branches of science and commerce, and teaching the next generation of mathematicians requires specific skills. The Bachelor of Mathematics Education creates secondary teachers who understand best practice teaching methods in addition to holding a full mathematics major. This degree can also lead to other careers that require high-level training skills in the many business environments mathematics graduates find work.

Subjects focus on mathematical knowledge, learning and development, professional teaching skills, curriculum studies and meeting learners’ needs.

Professional Experience, or practical teaching, is undertaken in each year of the program. Students, who begin their professional experiences within weeks of starting the course, have the opportunity to undertake some of their experiences overseas, and finish with a five-week internship in the final year.

Bachelor of Medical Mathematics

go.uow.edu.au/bmedmath

The rapid development of medical technology and treatments has created a niche sector which relies on the skill sets of mathematicians and statisticians. Mathematical and statistical modelling and analysis are the key to future breakthroughs in areas including the understanding of biological systems, the treatment of diseases, drug development, and targeted clinical trials. This is because mathematics and statistics enable us to design meaningful yet streamlined experiments, find structure in data, and construct models that help to predict, and therefore control, future outcomes.

WHAT YOU WILL STUDY

The Bachelor of Medical Mathematics provides the tools and develops the skills required for advanced modelling and analysis in the medical and health sciences sector. The program includes a combination of mathematics, statistics, chemistry, biosciences, population health, medical imaging, physiology and psychology.

You will gain the skills needed to pursue careers in mathematics, statistics, medical research and industry, in areas such as genetics, epidemiology, medical imaging, drug delivery, neurophysiology, and pharmacokinetics.

CAREERS

The frontiers of biological and medical research are becoming increasingly dependent on sophisticated modelling and computational techniques. Mathematical and statistical analysis is rapidly emerging as a vital tool for health professionals.

The Bachelor of Medical Mathematics is a three-year degree pioneered by UOW in response to the needs identified by the medical and health sectors. The rapid development of medical technology has created a niche sector which relies on the skill sets of mathematicians and statisticians.

Graduates will have the skills needed to pursue careers in the health industry, pharmaceutical industry, public health systems and medical organisations. These include hospitals, CSIRO, Australian Bureau of Statistics, forensic research and universities. More generally graduates will be able to pursue careers in mathematics, statistics and medical research and they will be suitably prepared for postgraduate studies in medicine, mathematics and allied health professions.

“Businesses need people who can solve problems. That’s where my UOW degree has really helped me. Things are always evolving and while learning a trade is valuable, the most important skills are being able to solve problems and adapt to new situations.”

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BLAKE HENRICKS
Bachelor of Mathematics and Finance (2003)
Portfolio Manager / Analyst, Macquarie Group

“In my role, we do deep dive research, which involves financial modelling, meeting with company managers and going on site tours. Our aim is to deliver returns better than the ASX 200 index by investing in the best 30 stocks we can find.”

“I love coming to work. If you find something you enjoy doing, it’s not really work at all.”

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OTHER DEGREES
YOU MAY LIKE

This booklet is just a sample of the degrees on offer at UOW. Here are a few more from different study areas that may interest you.

Bachelor of Science (Physics)
Physics is fundamental to the study of all sciences. You’ll learn problem-solving, critical thinking and analytical skills that are in demand across all government and private sectors. You will learn the basis for making, interpreting and extending observations relating to the behaviour and structure of matter. Study areas include mechanics, thermodynamics, electricity and magnetism, vibrations, waves, optics, and modern, quantum and statistical mechanics.
go.uow.edu.au/bsci-phys

Bachelor of Engineering
Engineers design and create solutions to improve everyday life, from the large scale to the nano-level. You will study a common first year to learn about the different engineering fields before majoring in Civil, Computer, Electrical, Environmental or Materials Engineering. UOW’s engineering programs are accredited by Engineers Australia and relevant world engineering bodies through the Washington Accord.
go.uow.edu.au/bengineer

Bachelor of Computer Science
Computer scientists focus on designing methods, tools and writing programs for computer applications. The degree includes a core of programming and mathematics subjects as well as electives including databases, programming languages, artificial intelligence, computer security and computer graphics. In your final year you will develop your own application as part of a student team project, developing solutions to real-world problems.
go.uow.edu.au/bcompsci

DEAN’S SCHOLARS

Dean’s Scholar and Advanced degrees are designed to provide an enriched education experience, and to encourage high achievers to continue on to studies in Honours and research.

If you have an ATAR of 95 or above you can be admitted into Scholars. You must maintain an average mark of 80 per session to remain in the degree.

As a Scholar you receive the following special privileges:

- $500.00 per annum allowance
- Extended library access
- An academic mentor (a member of academic staff who advises you on matters concerning your degree)
- Research project as part of the degree
- Colloquium/seminar series on topics designed to be of interest to Dean’s Scholar/Advanced students
- Opportunity to apply for competitive summer scholarships

SCHOLARSHIPS

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<tr>
<th>SCHOLARSHIP</th>
<th>VALUE</th>
<th>NUMBER AVAILABLE</th>
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<tbody>
<tr>
<td>Vice-Chancellor’s Academic Excellence Scholarship</td>
<td>$3,000 for first year</td>
<td>1</td>
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<tr>
<td>University of Wollongong Undergraduate Scholarships</td>
<td>$4,000 p.a. for duration of degree</td>
<td>3</td>
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<tr>
<td>Engineering and Information Sciences - Academic Achievement Scholarship</td>
<td>$3,000 for first year</td>
<td>1</td>
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<tr>
<td>Engineering and Information Sciences - Academic Excellence Scholarship</td>
<td>$3,000 p.a. for 2 years</td>
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<td>Tibra Capital Corporate Scholarship</td>
<td>$1,000 for First Year</td>
<td>5</td>
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<tr>
<td>Tibra Capital Work Integrated Learning Scholarships</td>
<td>$15,000 for second or third year students</td>
<td>5</td>
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<tr>
<td>Mathematics and Statistics First Year Scholarship</td>
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<tr>
<td>Women in Engineering and Information Sciences Scholarship</td>
<td>$3,000 for 1 year</td>
<td>varies</td>
</tr>
<tr>
<td>Westpac Bicentennial Foundation Young Technologists Scholarship</td>
<td>$5,000 p.a. to 5 years</td>
<td>varies</td>
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IAN CHUBB
Australia’s Chief Scientist

Mathematics provides the vital underpinning of the knowledge economy, essential in the physical sciences, technology, business, financial services and many areas of ICT. It is also of growing importance in biology, medicine and many of the social sciences.

Mathematics enables us to probe the natural universe and to develop new technologies that have helped us control and master our environment, and change societal expectations and standards of living.

Mathematics is the only subject whose study consistently enhances performance across all fields of science. The decline in maths is affecting every part of our community. Recent surveys suggest that about one half of the community copes with the mathematics needed for everyday life.”

IAN CHUBB
Australia’s Chief Scientist
LEARN MORE

SEE US FOR YOURSELF
This book is just a part of who we are and what we do. Come and meet us face to face, and we'll show you why UOW is the place for you.

2015 UOW OPEN DAY Saturday 15 August
FREE CAMPUS TOURS Every Friday, 10am and 3pm

GET IN BRIGHT AND EARLY
Would you like to secure your place at UOW before you sit your HSC exams? Our Early Admission program can help you get there.
uow.edu.au/future/early-admission

ENGINEERING AND INFORMATION SCIENCES
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