Science and Mathematics

Postgraduate Courses 2019

Faculty of Science
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*Majors available are Biomedical Engineering, Marine Science and Management, Mathematical and Statistical Modelling or No Specific Major. No Specific Major not available for Master of Science (Honours).

Faculty snapshot

Students
4,339 total*
284 postgraduate by coursework**
401 postgraduate by research**

UTS at a glance*

Students
44,887 total
10,846 postgraduate by coursework
2002 postgraduate by research
32,039 undergraduate

UTS student diversity*

49% are female students
49% are born outside Australia
32% are 25 or older

*In 2017
**As of September 2018

Acknowledgement of Country

UTS acknowledges the Gadigal People of the Eora Nation and the Boorooberongal People of the Dharug Nation upon whose ancestral lands our campuses now stand. We would also like to pay respect to the Elders both past and present, acknowledging them as the traditional custodians of knowledge for these lands.
INCREASE YOUR EARNING POTENTIAL
A starting salary between $86,600 (coursework) and $95,000 (research)?*
Yes please! A UTS postgraduate degree puts you ahead of the curve: median full-time salaries for our graduates sit well above the national averages of $75,000-$80,000 (coursework) and $80,000-$83,000 (research)**. Of course, your actual salary will depend on the discipline and industry you work in, but the numbers don’t lie – when you graduate from UTS, you’ll be out in front.

* 2017 Graduate Outcome Survey,
** Graduate Careers Australia, Graduate Salaries 2015.

GO GLOBAL
In a highly competitive job market, you’ll need the right mix of skills to compete in a global economy – and a postgraduate degree is a great place to start. As well as signifying your expertise in a specific discipline, postgraduate qualifications also help you to build key professional skills like time management, critical thinking and communications – and employers know it. In fact, many international organisations now expect prospective candidates to have completed postgraduate study.

MORE THAN THE MONEY
Okay, so good jobs and strong starting salaries are great things to have, but a UTS postgraduate degree will give you more than a foot up the career ladder. Postgraduate study is about getting to know yourself, pursuing your passions, and building personal and professional networks that could shape your future. It’s also a great opportunity to reassess where you’re going – it could be the push you need to take your life in a new and challenging direction.

HAVE WE MET BEFORE?
Don’t stop at just one UTS degree. If you’ve previously graduated from UTS, you can save 10 per cent on postgraduate coursework fees when you return to study with us. It’s all thanks to the UTS Alumni Advantage program. For more info and conditions, head to alumni.uts.edu.au/advantage

So, what are you waiting for?
It’s time to take charge of your future, today.
MICHAEL WIDJAJA
Doctor of Philosophy (PhD)

“I have always been interested in little things and biology. The way microorganisms, especially bacteria, are able to exist fascinates me. So after completing a Bachelor of Medical Science (Honours) at UTS, I decided to pursue a PhD in microbiology.

My research involved looking at the tools (proteins) involved in the interaction between the bacteria, Mycoplasma pneumoniae (MPN), and the site where it causes infection - our lungs. This bacteria is one of the main causes of pneumonia in highly dense communities and once it’s in you, it’s difficult to remove.

What I found is that MPN compensates for its limited arsenal by a process known as cleavage. This is extremely interesting as it has not been seen in MPN before and now opens new avenues as to how tiny bacteria are so sufficient and difficult to kill during an infection.

By completing a research degree, I have been able to contribute to society’s knowledge on how microorganisms work and live.”

NATALIE SALEMKIN
Graduate Certificate in Mathematics

“I chose to study at UTS because it had the best ranked course in my field in the country. Mathematics is fascinating because it can reduce the impossible paradoxes of the universe down to manageable human terms.

This course is also helping me to refine my hard skills and see the world through another lens.

What I enjoy most about my course is meeting amazing professors, like Professor Anthony Dooley, who infect their students with their enthusiasm for the subject. UTS Science is also a very accommodating and nurturing environment where students can ask questions, flourish, explore and grow.

My advice to future maths postgraduate students is to give 100 per cent and make use of the Mathematics Study Centre on campus.”
Why science at UTS?

World-class facilities, a dynamic approach to learning and a research culture that’s second to none – a UTS Science postgraduate degree could be the launching pad for the next stage of your career.

MORE THAN JUST A PRETTY FACE
The transformation of the UTS Campus over the last few years is more than just skin-deep. Sure, we’ve got lots of beautiful new buildings, but it’s what’s inside them that counts. As a postgraduate science student, you’ll have access to world-class teaching, learning and specialist laboratories, such as proteomics, forensic and analytical chemistry, and environmental sciences, to name a few. You’ll be exposed to the latest technologies and specialist facilities across a range of scientific disciplines, including the DeltaVision OMX Blaze super resolution microscope; the UTS Data Arena; the UTS ProtoSpace (for 3D printing); and a purpose built Beam Chemistry Lab for fabricating nanostructured materials. Whether it’s our labs, industry and career hubs or collaborative learning spaces, our facilities are designed to help you get ahead.

RESEARCH THAT SHAPES THE WORLD – AND YOU
As a research-intensive faculty, we contribute about 30 per cent of UTS’s total research outputs. This means you’ll be learning from academics who are engaged in active research, often in partnership with leading industry organisations; and working on industry-standard equipment that’ll prepare you for life beyond the lab. And our strong research culture is good for everyone, whether you’re a research or coursework student – everything you learn will be informed by the latest research findings from around the world.

SKILLS FOR A REAL-WORLD CAREER
Scientific expertise is an essential component of a science degree, but it’s not the only knowledge you’ll gain when you study with us. Our courses combine discipline-specific studies with core professional skills, regardless of whether you’re studying a coursework or research degree. Think advanced communication, leadership in science, and research proposal writing. We also offer Innovation, Entrepreneurship and Commercialisation as a professional subject, where you’ll learn to generate ideas, develop products, manage IP and pitch to investors. You’ll graduate with broad expertise that’ll make you highly sought after in the world beyond university.
CONNECTIONS THAT COUNT
Get yourself in the room with your future employers thanks to UTS’s extensive industry connections. We’ve built strong relationships with leading scientific and related organisations in both the public and private sectors – and those relationships could help shape your future career. Network with industry leaders from CSIRO, GE, Agilent Technologies and the Australian Federal Police, or get involved with collaborative research projects that bring UTS together with a range of industry partners – think Sydney Water, NSW Department of Primary Industries, the Australian Federal Police, NSW Police and ANSTO.

A FLEXIBLE APPROACH
We know that postgraduate students have real-life responsibilities – which is why we’ve designed our courses to fit into busy lives. We take a blended approach to learning that mixes face-to-face and online content, and we’ve also built in an evening class option for all our compulsory subjects. Whether you work, look after kids or have other demands on your time, we’ve created a course structure that makes postgraduate study a real – and realistic – option.

WHEN IT COMES TO LEARNING, YOU’RE IN THE DRIVER’S SEAT
Our approach to learning is all about you. Called inquiry-based learning, it’s based on the investigation of questions, scenarios and problems that place you at the core of your own educational experience. You’ll learn to identify research issues and questions that will further develop your knowledge, and you’ll be encouraged to put your theoretical knowledge into action through workshops, live case studies and masterclasses.

Want more? UTS is the home of learning futures, an award-winning education methodology that combines a future-focused curriculum with informed technology use. It’s a creative approach to education that’s embedded in all our courses. Just like inquiry-based learning, it puts you front and centre of the learning experience – and it also equips you with the professional expertise, practical skills and innovation mindset that you’ll need to succeed in the future world of work.
What can I study?

Whatever you choose, you’ll have the opportunity to take charge of your own learning, and to shape your studies to reflect the things you care about.

There are lots of options when it comes to postgraduate courses at UTS Science. Depending on your bachelor’s degree, you could be eligible to study either a coursework qualification (graduate certificate, graduate diploma, master’s degree) or a research degree (masters by research, PhD). You’ll also become part of our vibrant postgraduate community, supported by world-leading academics who have a vested interest in your success.

A master’s degree is the highest coursework qualification on offer – it’s usually 1-2 years of study. Depending on your circumstances, you may decide to start with a graduate certificate (one session), or a graduate diploma (two sessions full-time) as a standalone qualification. If you love what you’re doing, you can progress from these shorter qualifications into a master’s degree.

INTERESTED IN RESEARCH?

All our majors will introduce you to the fundamental concepts of research. In fact, you can enrol in between 6 and 24 credit points of research project subjects, no matter which major you choose. To get in, you’ll need faculty approval, which is based on your academic achievements and the availability of suitable research projects. See page 34 for more information on postgraduate research at UTS Science.

Postgraduate coursework degrees available

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<thead>
<tr>
<th>MASTER OF FORENSIC SCIENCE</th>
<th>MASTER OF MEDICAL BIOTECHNOLOGY</th>
<th>MASTER OF QUANTITATIVE FINANCE</th>
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<tbody>
<tr>
<td>Choose to specialise in Forensic Science by completing a Master of Forensic Science; Master of Forensic Science (Extension); Master of Philosophy in Forensic Science; Graduate Diploma in Forensic Science or Graduate Certificate in Forensic Science. See pages 8-13.</td>
<td>Choose to specialise in Medical Biotechnology by completing a Master of Medical Biotechnology; Master of Medical Biotechnology (Extension); Master of Philosophy in Medical Biotechnology; Graduate Diploma in Medical Biotechnology or Graduate Certificate in Medical Biotechnology. See pages 14-19.</td>
<td>Complete 9 subjects covering financial economics, mathematics and computational methods over three sessions. See page 20.</td>
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<tr>
<th>MASTER OF SCIENCE</th>
<th>MASTER OF SCIENCE (EXTENSION)</th>
<th>MASTER OF SCIENCE (HONOURS)</th>
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<tr>
<td>Major choices include Biomedical Engineering, Marine Science and Management, Mathematical and Statistical Modelling or No Specific Major. See page 22.</td>
<td>Boost your Master’s degree with an additional 24 credit points. Major choices include Biomedical Engineering, Marine Science and Management, Mathematical and Statistical Modelling or No Specific Major. See page 23.</td>
<td>Add a research project to coursework subjects. Major choices include Biomedical Engineering, Marine Science and Management or Mathematical and Statistical Modelling. See page 24.</td>
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<td>See page 25.</td>
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Postgraduate research degrees available

COURSEWORK OR RESEARCH, WHAT’S THE DIFFERENCE?
With a coursework degree, you’ll work your way through a structured series of subjects or credit points in order to attain your degree. You’ll attend classes, write assessments and sit exams – the format is similar to an undergraduate degree, but the course content is about building highly advanced knowledge in your chosen field or discipline. In some cases, you can add a research component to your coursework studies.

With a postgraduate research degree, you’ll undertake supervised study and research under the guidance of an academic supervisor. You’ll work independently on your chosen project with the aim of producing, presenting and submitting an original thesis. But it’s not all work and no play – you’ll also be encouraged to get involved in a range of events for research students right here on the UTS campus. These include the Three Minute Thesis (3MT) Competition, a national event where PhD candidates present their research in just three minutes (winner receives fame, glory and cash!). We also help our upcoming researchers to develop their science communication and media skills, a great skill to have as a science or mathematics researcher.

NEED A SOUNDING BOARD? TALK TO US
Choosing the right course isn’t always straightforward – but help is at hand. We hold regular postgrad info sessions where you can talk to our program directors, apply to study at UTS, and meet other students who are considering the leap into postgraduate study. It’s a great opportunity to talk through your options and to get a feel for the people who run our courses.

There are usually two UTS-wide postgrad expos each year, as well as science and maths info sessions which run almost monthly. The best bit? They’re all in the evenings, so you can fit them in around work and other commitments.

Head to science.uts.edu.au/future to register your spot or email science.future@uts.edu.au

DOCTOR OF PHILOSOPHY (SCIENCE)
See page 36.

DOCTOR OF PHILOSOPHY (MATHEMATICAL SCIENCES)
See page 36.

MASTER OF SCIENCE (RESEARCH)
See page 37.

MASTER OF SCIENCE (RESEARCH) IN MATHEMATICAL SCIENCES
See page 38.

MASTER OF SCIENCE (RESEARCH)
See page 37.

MASTER OF SCIENCE (RESEARCH) IN MATHEMATICAL SCIENCES
See page 38.

DOCTOR OF PHILOSOPHY (SCIENCE)
See page 36.

DOCTOR OF PHILOSOPHY (MATHEMATICAL SCIENCES)
See page 36.
Forensic Science

Fingermark detection, fire analysis, trace evidence and drug toxicology – these are just a few of the forensic science disciplines in which UTS has made its name.

We’re the Australian leader in forensic science education, and we offer a suite of degrees that can take you from lab to crime scene to courtroom. We’ve recently revamped our courses with all new subjects – so when you study with us, you’ll be choosing a course that reflects the changing nature of the field.

All our course content comes straight from the real world – it’s based on extensive collaborative research between the UTS Centre for Forensic Science and a range of police, academic and scientific industry partners – and our facilities do too. Our learning spaces are modelled on operational laboratories, and they’re stocked with same industry-standard equipment that’s used by forensic science practitioners and researchers around the world.

CAREER OPTIONS
Include positions in government or private organisations, such as police forensic laboratories, law enforcement agencies, government or private forensic or drug detection labs, customs and border protection agencies and environmental protection agencies.

EMPLOYERS
Include analytical labs, law enforcement agencies, state and federal police, private forensic or drug detection labs, customs, quarantine and border protection agencies, environmental protection agencies.

ADMISSION REQUIREMENTS
Master of Forensic Science/Master of Forensic Science (Extension)/Graduate Diploma in Forensic Science/Graduate Certificate in Forensic Science:
Entry into the course requires the completion of a bachelor’s, master’s, graduate diploma or graduate certificate qualification in chemical sciences, biochemistry and cell biology, human biology, forensic science or medical science.

Master of Philosophy in Forensic Science:
Students who have commenced the Master of Forensic Science or Master of Forensic Science (Extension), and demonstrated research potential, can apply for an internal course transfer to this course.

See page 44 for more info on how to apply.

Complete a Master of Forensic Science, or choose from our suite of forensic science courses:
- Master of Forensic Science (Extension)
- Master of Philosophy in Forensic Science
- Graduate Diploma in Forensic Science
- Graduate Certificate in Forensic Science.
Learn from the best

XANTHE SPINDLER
Senior Lecturer, School of Mathematical and Physical Sciences

If you’ve ever left a fingerprint at a crime scene, you’d better hope Dr Xanthe Spindler isn’t anywhere nearby. A Senior Lecturer in the UTS Centre for Forensic Science and an invited member of the International Fingerprint Research Group, Xanthe is a world-recognised expert in fingerprint science (or fingermark as it’s known in the field). Her research is focused on understanding the methods of detecting latent (hidden) fingermarks on forensic evidence and at crime scenes, the different factors that affect the success rates of detection processes, and the development of biomolecular and chemical methods to capture fingermarks that may be missed by current processes. And Xanthe’s research isn’t confined to the lab - her work has led to partnerships with the Australian Federal Police, NSW Police, Victoria Police and a number of international universities, and has also attracted substantial ARC funding. Xanthe is the forensic science postgraduate course director, and a passionate teacher, supervisor and mentor to several postgraduate research students at UTS Science.

SERGIO JOSHUA
Master of Science in Forensic Science

“Having studied a Bachelor of Forensic Biology in Biomedical Science; I really wanted to take what I had learned from the biology subjects and complement that with the forensic chemistry subjects available in the master’s program.

I really enjoy the specialist subjects that UTS offers for forensics. It’s very practical based, and has some real-life scenarios to work with—as is used in real casework and in the field. The academic staff and teaching associates really work hard to give you the best experiences in the subjects.

Studying at UTS was an obvious choice for me, since it’s among the leading universities in the field of forensic science. Its strong connections with law enforcement and related industry partners means that both the forensic science coursework and research is continually evolving and filtered through to our learning and development.”
Find yourself front and centre of complex and challenging criminal cases with the Master of Forensic Science. You’ll start by building a holistic overview of forensic science practice before engaging in the in-depth study of forensic methods and techniques, including new subjects in inference and interpretation, chemical criminalistics, toxicology and drug analysis, and crime scene investigation.

Want more? You won’t just build skills for the lab – you’ll also study a range of professional subjects, such as communication, work health and safety, and statistical design. In your second year of study, you’ll also have the option to complete a forensic science research internship.

WHAT WILL I STUDY?
If you’re studying full-time, you’ll complete a total of 72 credit points (cp) of core forensic science, and professional subjects, over 1.5 years. Need to study part-time? No problem, we offer the Master of Forensic Science as a part-time option too.

Course structure

**YEAR 1**
- Advanced Communication Skills in Science (6cp)
- Foundations of Forensic Science (8cp)
- Forensic Inference & Interpretation (8cp)
- Select 10 credit points from the following:
  - Leadership in Science (8cp)
  - Innovation, Entrepreneurship and Commercialisation (8cp)
  - Ethics in Human Research (2cp)
  - Ethics in Animal Research (2cp)
  - Laboratory Management (4cp)
  - Risk Assessment and Management for Science (4cp)
  - Research Proposal Writing (2cp)
  - Work Health and Safety for Science (8cp)
  - Professional Science Writing (2cp)
  - Science Business Models and Intellectual Property (4cp)
- Select 16 credit points from the following:
  - Crime Scene Investigation & Management (8cp)
  - Forensic Toxicology and Drug Analysis (8cp)
  - Advanced Chemical Criminalistics (8cp)
  - Biometrics & Identification Sciences (8cp)
  - Forensic Science Research Internship Project A (8cp)
  - Forensic Science Research Internship Project B (8cp)
  - Forensic Science Research Internship Project C (16cp)
  - Forensic Science Research Internship Project D (16cp)

**YEAR 2**
- Understanding Data and Statistical Design (6cp)
- Select 2 credit points from the following:
  - Ethics in Human Research (2cp)
  - Ethics in Animal Research (2cp)
  - Risk Assessment and Management for Science (2cp)
  - Research Proposal Writing (2cp)
  - Professional Science Writing (2cp)
- Select 16 credit points from the following:
  - Crime Scene Investigation & Management (8cp)
  - Forensic Toxicology and Drug Analysis (8cp)
  - Advanced Chemical Criminalistics (8cp)
  - Biometrics & Identification Sciences (8cp)
  - Forensic Science Research Internship Project A (8cp)
  - Forensic Science Research Internship Project B (8cp)
  - Forensic Science Research Internship Project C (16cp)
  - Forensic Science Research Internship Project D (16cp)
Extend your master’s degree a further six months by adding on some electives in the **Master of Forensic Science (Extension)**. In this degree, you’ll develop those holistic skills in forensic practice such as forensic methods and techniques, toxicology and drug analysis, and crime scene investigation. Then you’ll fine tune your professional skills with subjects such as communication, work health and safety, and research proposal writing. But why stop there? Expand your knowledge and skillset by choosing from a broad range of electives such as finance management, environmental policy, psychology and technology and innovation management.

**WHAT WILL I STUDY?**
If you’re studying full-time, you’ll complete a total of 96 credit points (cp) of core forensic science, professional and elective subjects across two years of study (48cp in each year). Need to study part-time? No problem, we offer the Master of Forensic Science (Extension) as a part-time option too.

### Course structure

#### YEAR 1
- Advanced Communication Skills in Science (6cp)
- Foundations of Forensic Science (8cp)
- Forensic Inference & Interpretation (8cp)
- Select 10 credit points from the following:
  - Leadership in Science (8cp)
  - Innovation, Entrepreneurship and Commercialisation (8cp)
  - Ethics in Human Research (2cp)
  - Ethics in Animal Research (2cp)
  - Laboratory Management (4cp)
  - Risk Assessment and Management for Science (4cp)
  - Research Proposal Writing (2cp)
  - Work Health and Safety for Science (8cp)
  - Professional Science Writing (2cp)
  - Science Business Models and Intellectual Property (4cp)
- Select 16 credit points from the following:
  - Crime Scene Investigation & Management (8cp)
  - Forensic Toxicology and Drug Analysis (8cp)
  - Advanced Chemical Criminalistics (8cp)
  - Biometrics & Identification Sciences (8cp)
  - Forensic Science Research Internship Project A (8cp)
  - Forensic Science Research Internship Project B (8cp)
  - Forensic Science Research Internship Project C (16cp)
  - Forensic Science Research Internship Project D (16cp)

#### YEAR 2
- Understanding Data and Statistical Design (6cp)
- Electives (Science PG) (24cp)
- Select 2 credit points from the following:
  - Crime Scene Investigation & Management (8cp)
  - Forensic Toxicology and Drug Analysis (8cp)
  - Advanced Chemical Criminalistics (8cp)
  - Biometrics & Identification Sciences (8cp)
  - Forensic Science Research Internship Project A (8cp)
  - Forensic Science Research Internship Project B (8cp)
  - Forensic Science Research Internship Project C (16cp)
  - Forensic Science Research Internship Project D (16cp)
Interested in both coursework and research? The Master of Philosophy in Forensic Science could be for you. You’ll build in-depth theoretical expertise, gain business and managerial skills, and develop an experimental, analytical or theoretical academic investigation on a topic you’re passionate about. In this course, you’ll need to first complete 48 credit points of the Master of Forensic Science or Master of Forensic Science (Extension), and then apply for an internal course transfer into the Master of Philosophy in Forensic Science. You’ll also need a credit average, and also demonstrate that you’ve got the right skills for research.

This course is a potential pathway to a PhD, especially if you didn’t complete an honours year in your undergraduate degree. Head to page 34 for more information on research degrees at UTS.

WHAT WILL I STUDY?
If you’re studying full-time, you’ll complete 48 credit points (cp) of core forensic science and professional subjects in your first year. In your second year of study, you’ll complete a research project. The Master of Philosophy in Forensic Science is also available to complete on a part-time basis.

Course structure

YEAR 1
- Advanced Communication Skills in Science (6cp)
- Foundations of Forensic Science (8cp)
- Forensic Inference & Interpretation (8cp)
- Understanding Data and Statistical Design (6cp)

Select 12 credit points from the following:
- Leadership in Science (8cp)
- Innovation, Entrepreneurship and Commercialisation (8cp)
- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Laboratory Management (4cp)
- Risk Assessment and Management for Science (4cp)
- Research Proposal Writing (2cp)
- Work Health and Safety for Science (8cp)
- Professional Science Writing (2cp)
- Science Business Models and Intellectual Property (4cp)

YEAR 2
- Forensic Science Thesis 1 (24cp)
- Forensic Science Thesis 2 (24cp)

Select 8 credit points from the following:
- Crime Scene Investigation & Management (8cp)
- Forensic Toxicology and Drug Analysis (8cp)
- Advanced Chemical Criminalistics (8cp)
- Biometrics & Identification Sciences (8cp)
- Forensic Science Research Internship Project A (8cp)
**Graduate Diploma in Forensic Science**

Complete your postgraduate qualification in forensic science in one year of full-time study (or two years part-time), with the Graduate Diploma in Forensic Science. You’ll complete three compulsory subjects – two in forensic science and one in the professional stream. Then you’ll make your degree your own, with a mix of professional and forensic science subjects, from chemical criminalistics and crime investigation management to lab management and intellectual property. This course is a great way to see if postgraduate study is for you, before applying or transferring to the Master of Forensic Science. Credit points gained in the graduate diploma can be applied to the master’s degree too.

**WHAT WILL I STUDY?**
If you’re studying full-time, you’ll complete 48 credit points (cp) of subjects in a year. A part-time option is available too.

### Course structure

**YEAR 1**
- Foundations of Forensic Science (8cp)
- Forensic Inference & Interpretation (8cp)
- Understanding Data and Statistical Design (6cp)
- Select 16 credit points of forensic science subjects
- Select 10 credit points of professional subjects

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**Graduate Certificate in Forensic Science**

Dip your toe into postgraduate study with a Graduate Certificate in Forensic Science. You’ll complete a total of 24cp, consisting of 16cp of core forensic science subjects and 8cp of professional electives. Knock over the graduate certificate in six months or stretch it out over one year to suit your life circumstances.

A graduate certificate is a great way to find out if postgrad study in forensic science is for you, before applying or transferring to the Master of Forensic Science or the Graduate Diploma in Forensic Science. Credit points gained in the graduate certificate can be applied to the master’s degree or graduate diploma too.

### Course structure

**YEAR 1**
- Foundations of Forensic Science (8cp)
- Forensic Inference & Interpretation (8cp)
- Select 8 credit points of professional subjects
Medical biotechnology is a rapidly expanding field that uses cell biology to solve next-generation medical, agricultural and environmental challenges.

In a health context, medical biotechnology drives the development of diagnostic, preventive and therapeutic tools – think vaccines, stem cells, and biomedical devices, to name a few. These tools improve our response to a range of chronic conditions, from autoimmune and inflammatory diseases to cancer. Beyond the human body, biotechnology has a wealth of applications in the field of food production and environmental management. By studying Medical Biotechnology, you’ll gain insights into the technologies and methods scientists use to produce the next generation of pharmaceuticals, vaccines and more.

CAREER OPTIONS
Laboratory managers, industry professional representatives, government and sector roles supporting the biotechnology or medical technology industries, professional scientific writers, text book and editorial roles in biotechnology, medical technology or biotechnology company sales representatives, researchers in the medical technology sector.

EMPLOYER OPTIONS
Pharmaceutical companies, biotechnology companies, hospitals, medical and research laboratories, universities, government departments, diagnostic medical labs, medical device companies.

ADMISSION REQUIREMENTS
Master of Medical Biotechnology/Master of Medical Biotechnology (Extension)/Graduate Diploma in Medical Biotechnology/Graduate Certificate in Medical Biotechnology:
Entry into the course requires the completion of a bachelor’s, master’s, graduate diploma or graduate certificate qualification in biochemistry and cell biology, microbiology, human biology, genetics, laboratory technology, medical science, food science and biotechnology or pharmacology.

Master of Philosophy in Medical Biotechnology:
Students who’ve commenced the Master of Medical Biotechnology or Master of Medical Biotechnology (Extension), and have demonstrated research potential, can apply for an internal course transfer to this course.

See page 40 for more info on how to apply.
Learn from the best

**WILLA HUSTON**
Associate Head of School (Teaching and Learning), School of Life Sciences

Dr Willa Huston is a dynamic academic known for her passion for teaching and learning and advocacy in championing equity and diversity in science. As a molecular microbiologist, Willa’s research is focussed on understanding chlamydial diseases, including the mechanisms of disease, persistence, and how the disease causes infertility in women. Willa’s research team has ongoing projects in chlamydial biology, human disease pathogenesis, diagnosis and treatment, pelvic inflammatory disease, and koala chlamydia treatments. Willa also makes a significant contribution to diversity in science at UTS. She serves as co-convener of the UTS Academic Women in Science group, Chair of the Faculty of Science Equity and Diversity Committee, and is a member of the UTS Athena SWAN Communications Committee. Willa is the postgraduate course director for the Medical Biotechnology program.

**SUMIT BORHADE**
Master of Science (Honours) in Medical Biotechnology

“Before coming to UTS, I completed a Bachelor of Pharmacy. My interest in research and development motivated me to study medical biotechnology, as it covers more of the components necessary to be a successful research scientist.

Choosing to study at UTS was pretty obvious for me given it’s the #1 young university in Australia. Also, the professional courses prepare you well for working in Australian workplace.

I have always found science fascinating and UTS Science has helped to nurture my passion for science. After I complete my master’s degree, my goal is to gain work in a pharmaceutical or biotechnology company as a research scientist or work for a research organisation.

If you are passionate about research and small things which makes a bigger difference, this degree is for you.”
Build expertise in the rapidly expanding field of medical biotech with the Master of Medical Biotechnology. You’ll develop skills in microscopy, flow cytometry, proteomics and biotechnology as they relate to infectious diseases and medical devices. You’ll also gain insights into the technologies and methods used to produce next generation pharmaceuticals and vaccines.

We pride ourselves on producing graduates with an innovative mindset, so you’ll also be pushed to think outside the box when it comes to tackling real-world biotechnology and medical challenges.

**WHAT WILL I STUDY?**

If you’re studying full-time, you’ll complete a total of 72 credit points (cp) of core medical biotechnology and professional subjects. There are six compulsory medical biotechnology and professional subjects to complete, then you’ll be able to personalise your degree by choosing from a mix of medical biotech, professional and elective subjects. Need to study part-time? No problem, we offer the Master of Medical Biotechnology as a part-time option too.

**Course structure**

**YEAR 1**

- Advanced Communication Skills in Science (6cp)
- Advanced Microscopy and Imaging (8cp)
- Experimental and Diagnostic Flow Cytometry (8cp)
- Understanding Data and Statistical Design (6cp)
- Proteomics (8cp)
- Biotechnology Solutions to Infectious Diseases (8cp)

**Select 4 credit points from the following:**

- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Risk Assessment and Management for Science (2cp)
- Research Proposal Writing (2cp)
- Professional Science Writing (2cp)

**YEAR 2**

- Electives (Science PG) (16cp)

You can also choose to complete a Medical Biotechnology Research Internship worth 8 or 16cp.

**Select 8 credit points from the following:**

- Leadership in Science (8cp)
- Innovation, Entrepreneurship and Commercialisation (8cp)
- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Laboratory Management (4cp)
- Risk Assessment and Management for Science (2cp)
- Research Proposal Writing (2cp)
- Work Health and Safety for Science (8cp)
- Professional Science Writing (2cp)
- Science Business Models and Intellectual Property (4cp)
Extend your master’s degree a further six months by adding on some electives in the Master of Medical Biotechnology (Extension). Gain skills in microscopy, flow cytometry, proteomics and biotechnology as they relate to infectious diseases and medical devices. Develop your professional skills with subjects such as communication, work health and safety, and research proposal writing.

But why stop there? Expand your knowledge and skillset by choosing from a broad range of electives, such as finance management, environmental policy, psychology and technology and innovation management.

**WHAT WILL I STUDY?**

If you’re studying full-time, you’ll complete a total of 96 credit points (cp) of core medical biotechnology, professional and elective subjects over two years. Need to study part-time? No problem, we offer the Master of Forensic Science (Extension) as a part-time option too.

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**Course structure**

**YEAR 1**

- Advanced Communication Skills in Science (6cp)
- Advanced Microscopy and Imaging (8cp)
- Experimental and Diagnostic Flow Cytometry (8cp)

**Select 4 credit points from the following:**

- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Risk Assessment and Management for Science (2cp)
- Research Proposal Writing (2cp)
- Professional Science Writing (2cp)

- Understanding Data and Statistical Design (6cp)
- Proteomics (8cp)
- Biotechnology Solutions to Infectious Diseases (8cp)

**YEAR 2**

- Electives (Science PG) (40cp)
  You can also choose to complete a Medical Biotechnology Research Internship worth 8 or 16cp.

**Select 8 credit points from the following:**

- Leadership in Science (8cp)
- Innovation, Entrepreneurship and Commercialisation (8cp)
- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Laboratory Management (4cp)
- Risk Assessment and Management for Science (2cp)
- Research Proposal Writing (2cp)
- Work Health and Safety for Science (8cp)
- Professional Science Writing (2cp)
- Science Business Models and Intellectual Property (4cp)
Get the best of both coursework and research in the Master of Philosophy in Medical Biotechnology. In this course, you’ll need to first complete 48 credit points in the Master of Medical Biotechnology or Master of Medical Biotechnology (Extension), and then apply for an internal course transfer into the Master of Philosophy in Medical Biotechnology. You’ll also need a credit average, and also demonstrate that you’ve got the right skills for research.

This course is a potential pathway to a PhD, especially if you didn’t complete an honours year in your undergraduate degree. Head to page 34 for more information on research degrees at UTS.

**WHAT WILL I STUDY?**
If you’re studying full-time, you’ll complete 48 credit points (cp) of medical biotechnology and professional subjects in your first year. In your second year of study, you’ll complete 48cp of a research project. The Master of Philosophy in Forensic Science is also available to complete part-time.

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**Course structure**

**YEAR 1**
- Advanced Communication Skills in Science (6cp)
- Advanced Microscopy and Imaging (8cp)
- Experimental and Diagnostic Flow Cytometry (8cp)
- Understanding Data and Statistical Design (6cp)
- Proteomics (8cp)
- Biotechnology Solutions to Infectious Diseases (8cp)

**Select 4 credit points from the following:**
- Ethics in Human Research (2cp)
- Ethics in Animal Research (2cp)
- Risk Assessment and Management for Science (2cp)
- Research Proposal Writing (2cp)
- Professional Science Writing (2cp)

**YEAR 2**
- Medical Biotechnology Thesis 1 (24cp)
- Medical Biotechnology Thesis 2 (24cp)
Graduate Diploma in Medical Biotechnology

Complete your postgraduate qualification in medical biotechnology in one year of full-time study with the Graduate Diploma in Medical Biotechnology. You’ll complete a mix of core medical biotechnology and professional subjects, from biotechnology solutions to infectious diseases and ethics in human or animal research; to science business models and intellectual property. This is a great way to see if postgraduate study is for you, before applying or transferring to the Master of Medical Biotechnology. Credit points gained in the graduate diploma can be applied to the master’s degree too.

**WHAT WILL I STUDY?**
If you’re studying full-time, you’ll complete 48 credit points (cp) of subjects in a year. A part-time option is available too.

**Course structure**

**YEAR 1**
- Advanced Microscopy and Imaging (8cp)
- Experimental and Diagnostic Flow Cytometry (8cp)
- Understanding Data and Statistical Design (6cp)
- Proteomics (8cp)
- Biotechnology Solutions to Infectious Diseases (8cp)
- Select 10 credit points of professional subjects

Graduate Certificate in Medical Biotechnology

Dip your toe into postgraduate study with a Graduate Certificate in Medical Biotechnology. Choose from a broad range of medical biotechnology and professional subjects to suit your interests, from proteomics to leadership in science or grant writing. Knock over the graduate certificate in six months or stretch it out over one year to suit your life circumstances. It’s a great way to find out if postgrad study in medical biotechnology is for you, before applying or transferring to the Master of Medical Biotechnology or the Graduate Diploma in Medical Biotechnology. Credit points gained in the graduate certificate can be applied to the master’s or graduate diploma too.

**Course structure**

**YEAR 1**
- Select 16 credit points from the following:
  - Advanced Microscopy and Imaging (8cp)
  - Experimental and Diagnostic Flow Cytometry (8cp)
  - Biotechnology Solutions to Infectious Diseases (8cp)
  - Proteomics (8cp)
- Select 8 credit points of professional subjects
Combine your passion for financial economics, mathematics and computational methods with the Master of Quantitative Finance. This course is focused on derivative security pricing, financial engineering and risk management – and it’s been structured to prepare you for work in the modern finance industry. You’ll learn how to critically analyse financial data for effective decision-making, and gain confidence in addressing complex financial trading and risk management issues using innovative financial models. You’ll graduate with specialised knowledge, professional competency and high-level technical skills in quantitative finance, ready to excel in a range of financial careers.

**Career options** include quantitative analysts, risk management analysts, pricing analysts, quantitative developers, forecasters, traders, investment analysts and financial engineers.

**Employers** include banks, the Reserve Bank of Australia, regulators such as APRA, hedge funds, insurance organisations, consulting firms such as Deloitte and Price Waterhouse Coopers, energy firms, Woolworths, Coles, to name a few.

**ADMISSION REQUIREMENTS**
The minimum admission requirement is a related degree with a strong quantitative component. Students accepted into this degree typically have a bachelor’s degree in mathematics, statistics, science, physics, engineering, actuarial studies, econometrics, mathematical finance or computer science. See page 40 for more info on how to apply.

**WHAT WILL I STUDY?**
If you’re studying full-time, you’ll complete 72 credit points (cp) of core subjects over three sessions in autumn, spring and summer. A part-time option is available too.

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**Course structure**

**YEAR 1**

**Autumn Session:**
Fundamentals of Derivative Security Pricing (8cp)
Financial Market Instruments (8cp)
Statistics and Financial Econometrics (8cp)

**Spring Session:**
Interest Rates and Credit Risk Models (8cp)
Probability Theory and Stochastic Analysis (8cp)
Risk Management (8cp)

**Summer Session:**
Quantitative Portfolio Analysis (8cp)
Numerical Methods in Finance (8cp)
Computational Methods and Model Implementation (8cp)
MINH LE
Master of Quantitative Finance

“I completed a Bachelor of Business at UTS and decided to pursue postgraduate studies to enhance my technical knowledge in the investment industry. As a Portfolio Analyst at Sunsuper Superannuation Fund, I know mathematics and programming are now essential in almost every corner of this field. Large firms are hiring science and engineering graduates, rather than traditional business students and to be well-ahead of this game, you need a high-quality degree like this.

UTS Science has a great and diversified culture, career oriented programs and modern/advanced technology that students can apply in their workplace. UTS courses also have a really strong focus on the practical side of things. I’m learning programming from scratch and applying that straight away into the assignment.

I’ve always been fascinated about how people come up with all the fancy formulas and theories in financial markets. Having a chance to study this degree helps me to gain a deeper understanding about how these work.”
Already a science or maths graduate but looking for something more? With the Master of Science, you’ll gain advanced scientific knowledge and an in-depth understanding of how science interacts with a range of opportunities in business, industry, research or government. We’ll help you build analytical skills, disciplinary knowledge, creative and logical problem-solving skills and fundamental management expertise – and we can also set you on the path towards a research degree (subject to faculty approval).

WHICH MAJOR IS FOR ME?
The best bit about this degree? Choosing a major that aligns with your professional goals. Whether you’re a budding biomed specialist, a marine science fanatic or a mathematician at heart, our majors will help you build theoretical knowledge and technical skills in the field you care about most. More of a generalist? Choose our no specific major option and gain expertise across a range of scientific disciplines.

Majors to choose from are:
- Biomedical Engineering (page 26)
- Mathematical and Statistical Modelling (page 28)
- Marine Science and Management (page 30)
- No specified major (page 32).

ADMISSION REQUIREMENTS
Completion of a UTS recognised bachelor’s degree, or an equivalent or higher qualification, or submission of other evidence of general and professional qualifications that demonstrates potential to pursue graduate studies. Entry into any of the majors requires a minimum of a Bachelor’s degree in a related discipline. See page 40 for more info on how to apply.

WHAT WILL I STUDY?
If you’re studying full-time, you’ll complete 72 credit points (cp) over 1.5 years, comprising of 48cp of subjects from your chosen major, and 24cp of professional subjects. A part-time option is available too. See pages 26-32 for the typical program of study for each major.
The Master of Science (Extension) is a master’s degree with a little bit more. You’ll choose a major in your preferred specialisation and learn how to combine industry experience with managerial and business skills to prepare you for the future world of work. Then, you’ll broaden your area of expertise by exploring elective subjects that could take you down new paths of enquiry. The upshot? You’ll graduate with a degree that will make you more than a scientist – you’ll be a discipline expert with the skills to lead new and exciting developments in your field, ready to take on new business and industry challenges.

WHICH MAJOR IS FOR ME?
The best bit about this degree? Choosing a major that aligns with your professional goals. Whether you’re a budding biomed specialist, a marine science fanatic or a mathematician at heart, our majors will help you build theoretical knowledge and technical skills in the field you care about most. More of a generalist? Choose our no specific major option and gain expertise across a range of scientific disciplines.

Majors to choose from are:
- Biomedical Engineering (page 26)
- Mathematical and Statistical Modelling (page 28)
- Marine Science and Management (page 30)
- No specified major (page 32).

ELECTIVE SUBJECTS
Electives give you the freedom to follow your passions and build expertise beyond your chosen major and professional knowledge and skills.

ADMISSION REQUIREMENTS
Completion of a UTS recognised bachelor’s degree, or an equivalent or higher qualification, or submission of other evidence of general and professional qualifications that demonstrates potential to pursue graduate studies. Entry into any of the majors requires a minimum of a Bachelor’s degree in a related discipline. See page 40 for more info on how to apply.

WHAT WILL I STUDY?
If you’re studying full-time, you’ll complete 96 credit points (cp) over 2 years, comprising of 48cp of subjects from your chosen major, 24cp of professional subjects and 24 cp of electives. A part-time option is available too. See pages 26-32 for the typical program of study for each major.
Ready to take the first steps towards a research degree? The Master of Science (Honours) combines scientific knowledge and industry experience, with the chance to undertake a research project in your chosen specialisation. It’s a mix of course work and research, so you’ll build in-depth theoretical expertise, gain business and managerial skills, and develop an experimental, analytical or theoretical academic investigation on a topic you’re passionate about.

In this course, you’ll need to first complete 48 credit points in the Master of Science or Master of Science (Extension), and then apply for an internal course transfer into the Master of Science (Honours). You’ll also need a credit average and demonstrate that you’ve got the right skills for research. This course is a potential pathway to a PhD, especially if you didn’t complete an honours year in your undergraduate degree. Head to page 34 for more information on research degrees at UTS.

Majors to choose from are:
- Biomedical Engineering (page 26)
- Mathematical and Statistical Modelling (page 28)
- Marine Science and Management (page 30).

ADMISSION REQUIREMENTS
The Master of Science (Honours) is offered via internal course transfer only. That means you can apply to transfer from the Master of Science (Extension) or Master of Science after you’ve completed 48 credit points (cp) of study.

WHAT WILL I STUDY?
If you’re studying full-time, you’ll complete 96cp over two years, comprising of 24cp of subjects from your chosen major, 24cp of professional subjects, and a research project (in your second year) worth 48cp. See pages 26–32 for the typical program of study for each major.
**Graduate Certificate in Mathematics**

Are you a business, engineering or science graduate? The **Graduate Certificate in Mathematics** is for non-maths grads who want to add maths expertise to their existing skill set, or who are preparing for further studies where maths knowledge is required. Retrain your brain with subjects in statistics, modelling and linear dynamics, and choose from elective subjects like forensic statistics, economics and decision making. Want more? This course is designed to give you a foot in the door to more advanced maths programs, such as the Mathematical and Statistical Modelling major in the Master of Science.

**ADMISSION REQUIREMENTS**
Applicants must have completed a UTS recognised bachelor’s degree, or an equivalent or higher qualification, or submitted other evidence of general and professional qualifications that demonstrates potential to pursue graduate studies.

**WHAT WILL I STUDY?**
You’ll complete 24 credit points (cp) of study over 1 session (6 months) or 2 sessions (1 year), depending on when subjects are offered.

**Course structure**

**YEAR 1**
- Linear Dynamical Systems (6cp)
- Modelling Change (6cp)
- Statistical Methods (6cp)
- Elective (6cp)

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**Graduate Certificate in Science**

Extend your knowledge of science beyond your undergraduate studies with a course that’ll give you a taste of the postgraduate life. The **Graduate Certificate in Science** will extend or renew your scientific knowledge, whether you’re a non-scientist hoping to move into the field or employed in a science or related role. Use your elective choices to pursue your interests in specific scientific disciplines, and build broad professional skills – such as communication, project management, innovation and entrepreneurship – that will add value to any future career. You can even apply for credit recognition if you’re ready to move on to the masters or graduate diploma with UTS Science.

**ADMISSION REQUIREMENTS**
Applicants must have completed a UTS recognised bachelor’s degree, or an equivalent or higher qualification, or submitted other evidence of general and professional qualifications that demonstrates potential to pursue graduate studies.

**WHAT WILL I STUDY?**
You’ll complete 24cp comprising of two science and two professional subjects.

**Course structure**

**YEAR 1**
Select 12cp from the following:
- Advanced Communication Skills in Science (6cp)
- Project Management in Science (6cp)
- Innovation, Entrepreneurship and Commercialisation (6cp)
- Understanding Data and Statistical Design (6cp)
- Linear Algebra (6cp)
- Electives (12cp)
Which major is for me?

Biomedical Engineering

Biomedical engineering is about using science and engineering principles to solve medical and biological problems.

This major will introduce you to a variety of applications around biomechanics, medical devices, tissue engineering, medical imaging, and diagnostic and therapeutic uses of nanotechnology.

If you’re a science or medical graduate, this major is a great way to expand your knowledge of medical technologies without the need for a full engineering degree – and it has extensive application in a range of growth areas in health, science and engineering.

CAREER OPTIONS

Work in medical device and biotechnology companies, government policy and regulation, hospitals and research organisations where your ability to combine biology and engineering knowledge and skills will be highly sought after. Graduates could also work in medical device and technology companies, such as Cochlear, or in leadership positions in government and regulatory departments, diagnostics medical labs and research organisations.

Course structure

Master of Science/Master of Science (Extension)

YEAR 1

Physiological Bases of Human Movement (6cp)
Advanced Communication Skills in Science (6cp)
Programming Fundamentals (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
Project Management in Science (6cp)
Biomedical Instrumentation (6cp)
Human Pathophysiology (6cp)
Select 6 credit points from the following:
  – Bionanotechnology (6cp)
  – Medical Devices and Diagnostics (6cp)
  – Medical and Applied Physiology (6cp)

YEAR 2

Select 24 credit points from the following:
  – Biomedical Engineering Project A (12cp)
  – Medical Imaging (6cp)
  – Molecular Nanotechnology (6cp)
  – Nanomaterials (6cp)
  – Neural Networks and Fuzzy Logic (6cp)
  – Physiological Systems (6cp)
  – Biomedical Polymers (6cp)
  – Tissue Engineering Scaffolds (6cp)

Select 24cp of electives (Master of Science (Extension) only).
Course structure
Master of Science (Honours)

YEAR 1
Physiological Bases of Human Movement (6cp)
Advanced Communication Skills in Science (6cp)
Programming Fundamentals (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
Project Management in Science (6cp)
Biomedical Instrumentation (6cp)
Human Pathophysiology (6cp)

Select 6 credit points from the following:
- Bionanotechnology (6cp)
- Medical Devices and Diagnostics (6cp)
- Medical and Applied Physiology (6cp)

YEAR 2
Science Honours Thesis 1 (24cp)
Science Honours Thesis 1 (24cp)

Which major is for me?
Biomedical Engineering
In a changing climate, there is a high demand for qualified scientists who understand the impact that climate change has on marine environments.

With the Marine Science and Management major, you’ll be ready for what the future holds. This is a truly cross-institutional, multidisciplinary major that spans the Sydney Institute of Marine Science and all its partnering institutions: UTS, University of Sydney, Macquarie University and the University of New South Wales.

You’ll study core units at UTS, undertake two electives at a SIMS partner university, and complete a capstone project at SIMS itself, which comprises a lecture series from SIMS scientists and a practical component using real-life data from the Australian Integrated Marine Observatory.

Want more? As well as gaining the expertise required to become a skilled marine scientist, you’ll build soft skills in areas such as project management, communication, commercialisation and entrepreneurship that will be highly regarded in any work environment.

**CAREER OPTIONS**

Work as a private consultant in fields such as policy and conservation, fisheries, environmental sustainability and management, impact assessment, tourism and education. Or, make a career U-turn and use your newfound skills to pursue new professional opportunities in marine science and management.

Graduates of this degree have found employment in estuary management companies, government and regulatory bodies, marine and conservation organisations, environment resource management and consulting organisations, local councils, environment protection authorities and research organisations.

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**Course structure**

**Master of Science/Master of Science (Extension)**

**YEAR 1**

- Advanced Communication Skills in Science (6cp)
- Innovation, Entrepreneurship and Commercialisation (6cp)
- External Marine Study 1 (6cp)
- Topics in Australian Marine Science (6cp)
- Understanding Data and Statistical Design (6cp)
- Project Management in Science (6cp)
- Climate Change and Ecological Modelling (6cp)

**Select 6 credit points from the following:**
- Marine Productivity and Climate Change
- Marine Communities
- Coral Reef Ecosystems

**YEAR 2**

- External Marine Study 2 (6cp)
- Monitoring Ecological Variability (6cp)

**Select 12 credit points from the following:**
- Fisheries Resources (6cp)
- Environment Research Project A (12cp)

**Select 24cp of electives (Master of Science (Extension) only).**
Course structure

Master of Science (Honours)

YEAR 1
Advanced Communication Skills in Science (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
External Marine Study 1 (6cp)
Topics in Australian Marine Science (6cp)
Understanding Data and Statistical Design (6cp)
Project Management in Science (6cp)
External Marine Study 2 (6cp)

Select 6 credit points from the following:
- Marine Productivity and Climate Change
- Marine Communities
- Climate Change and Ecological Modelling
- Coral Reef Ecosystems

YEAR 2
Science Honours Thesis 1 (24cp)
Science Honours Thesis 2 (24cp)

DAVID BOOTH
Professor of Marine Ecology, Program Director in Marine Science and Management

David Booth is Professor of Marine Ecology and the Program Director for postgraduate courses in Marine Science and Management. He is a well-respected and well-known academic having conducted research and teaching at UTS since 1994.

David is passionate about marine conservation and is a strong advocate of sustainable fisheries and marine parks. He has an active postdoctoral and graduate student group and his enthusiasm for his work is infectious.

With over 100 papers published in reef-fish ecology, climate change and the other anthropogenic impacts on fishes and fisheries, David is one of our “go-to people” when it comes to expertise in marine science.

His research interests include studying how tropical fish travel down the East Australian Current past Sydney, fishes in estuaries around Sydney, and the ecology and behaviour of threatened fishes, such as seadragons, black cod and white sharks.

HOLLY BONE
Master of Science (Honours) in Marine Science and Management

“I completed a Bachelor of Marine Biology at UTS and wanted to stay in this learning environment. My supervisors and teachers had all been very knowledgeable, professional and had practical experience from their own research and work before becoming academics.

My research project involves observing fish behaviours and community structures between different sites at Towra Point Nature Reserve, NSW.

I use GoPro and visual observation to try to capture undisturbed behaviours in the field, then I compare this data to habitat preference experiments I conduct in the lab. Ultimately the research aims to help manage the site against the threats of a changing environment.

After my research is completed, I’d like to find a job where I can still work in wetland environments (which I’ve come to deeply appreciate), and contribute to environmental management and education.”
This major is all about logistic and statistical modelling and analytic tools, and it’s been designed for students at varying levels of maths proficiency.

Whether you’re a non-mathematician hoping to increase your career opportunities or you’re already employed in a maths or related role, you can tailor your studies within the major to suit your level of expertise.

As well as gaining specific disciplinary knowledge, you’ll learn to approach problem solving using a range of creative and logical approaches. What’s more, you’ll gain fundamental management skills so you’ll be ready to drive people and projects in range of organisations.

CAREER OPTIONS
Apply your mathematics and statistics expertise to the banking and finance sectors, health industries, information technology sector.

Graduates of this major also work in market research, logistics and transport including with companies such as Lindsay Fox, and in large organisations including AGL, Woolworths and Coles.

Course structure
Master of Science/Master of Science (Extension)

YEAR 1
Linear Algebra (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
Advanced Communication Skills in Science (6cp)
Project Management in Science (6cp)
Select 12 credit points from the following:
- Elective (6cp)
- Advanced Calculus (6cp)
- Simulation Modelling (6cp)
- Quantitative Management Practice (6cp)
- Design and Analysis of Experiments (6cp)
- Programming for Data Analysis (6cp)
Select 12 credit points from the following:
- Sample Surveys
- Differential Equations
- Mathematical Methods
- Nonlinear Methods in Quantitative Management
- Network and Combinatorial Optimisation
- Advanced Statistical Modelling
- Stochastic Processes
- Mathematical Research Project A

YEAR 2
Select 24 credit points from the following:
- Advanced Calculus (6cp)
- Simulation Modelling (6cp)
- Quantitative Management Practice (6cp)
- Design and Analysis of Experiments (6cp)
- Programming for Data Analysis (6cp)
- Mathematical Research Project B (12cp)
- Mathematical Research Project (24cp)
Select 24cp of electives (Master of Science (Extension) only).
Course structure
Master of Science (Honours)

YEAR 1
Linear Algebra (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
Advanced Communication Skills in Science (6cp)
Project Management in Science (6cp)
Select 12 credit points from the following:
– Elective (6cp)
– Advanced Calculus (6cp)
– Simulation Modelling (6cp)
– Statistics for Quantitative Finance
– Quantitative Management Practice (6cp)
– Design and Analysis of Experiments (6cp)
– Programming for Data Analysis (6cp)
Select 12 credit points from the following:
– Stochastic Calculus in Finance
– Sample Surveys
– Differential Equations
– Mathematical Methods
– Nonlinear Methods in Quantitative Management
– Network and Combinatorial Optimisation
– Advanced Statistical Modelling
– Stochastic Processes

YEAR 2
Mathematics Thesis 1 (12cp)
Mathematics Thesis 2 (12cp)
Select 12 credit points from the following:
– Seminar A (6cp)
– Seminar B (6cp)
– Seminar C (6cp)
– Seminar D (6cp)
– Advanced Bayesian Methods (6cp)
– Advanced Stochastic Processes (6cp)
Select 12 credit points from the following:
– Seminar A (6cp)
– Seminar B (6cp)
– Seminar C (6cp)
– Seminar D (6cp)
– Modern Analysis with Applications (6cp)
– Multivariate Data Analysis (6cp)

LILY SERNA
Data Analyst, Atlassian

UTS Science graduate Lily Serna is a great example of someone with a varied and exciting career thanks to her qualifications in mathematics and finance. She works as a data analyst at Atlassian, the Australian software giant that generates more than half a billion dollars a year in revenue.

“I just love my job,” Lily said. “It involves doing all things maths – from statistical analysis to modelling and everything in between.

You may recognise Lily from her role as the in-house maths expert and co-host of SBS TV game show Letters and Numbers. She also presents on the ABC’s science show Catalyst.

Lily highly recommends considering a maths degree if you enjoy doing maths. And the bonus? Maths grads are in big demand.

“Most people with my skill-set are getting regular calls from recruiters, looking for people to fill data roles, because we’ve moved to an age where there’s enormous amounts of information that’s been gathered and there’s a huge need for people with the skills to make sense of that.”
No Specific Major

Passionate about more than one area of science? With the no specific major specialisation, you can combine subjects from various majors in a way that reflects your interests.

This option gives you the flexibility to craft your own degree, either to align with a specific career path or to satisfy your personal curiosity. It’s a great option if you’re looking to kickstart a science career, or if you’re an established scientist wanting to expand your expertise – either way, you’ll engage with a range of theoretical subjects and practical applications across a diverse field of enquiry.

This major option is not available in the Master of Science (Honours).

Course structure
Master of Science, Master of Science (Extension)

YEAR 1
Advanced Communication Skills in Science (6cp)
Project Management in Science (6cp)
Innovation, Entrepreneurship and Commercialisation (6cp)
Select 6 credit points of options:
  - Linear Algebra (6cp)
  - Programming Fundamentals (6cp)
  - Understanding Data and Statistical Design (6cp)
Select 48cp of options from choice block 90649 (No specified major):
View options at handbook.uts.edu.au/directory/cbk90649
Select 24cp of electives (Master of Science (Extension) only).
Research at UTS Science

Research. It’s who we are. At UTS Science, we’re passionate about knowledge that drives change – and the proof is in our reputation.

We’re known for producing world-leading research across a wealth of scientific disciplines – climate change, infectious diseases, biomedical materials and devices, forensic science, materials science, medical and health sciences, mathematics, physics, chemistry, biology and environmental sciences – and for delivering work that makes a tangible impact on people, communities and the environment.

In the latest (2015) Excellence in Research for Australia initiative, we were ranked at world standard – or above – in every single one of our research disciplines. In fact, our work in chemical sciences, material chemistry, environmental sciences and genetics were given the highest possible score, putting us on par with some of the world’s leading institutions. We’re also the top Australian university on the CWTS Leiden Ranking for the proportion of our research that appears in leading science journals.

TECHNOLOGY THAT DRIVES INNOVATION
We’re based in the UTS Vicki Sara Building (Building 7), a purpose-built $150M building equipped with sophisticated teaching and research facilities, including custom-designed labs across multiple disciplines. We also have teaching and research facilities in Building 4, which is currently being expanded to include seven levels of state-of-the-art research equipment.

As a research student, you’ll have access to a dedicated floor for analytical instrumentation, allowing you to investigate a diverse range of contemporary issues across biological, environmental and forensic sciences.

YOUR SUCCESS IS OUR SUCCESS
When you enrol in a research degree at UTS Science, you’ll become an integral part of our collaborative, outward-looking and future-focused research community. You’ll work at the frontiers of human knowledge, building fundamental research capabilities and gaining hands-on experience with the tools and technologies that define modern science.

You’ll also gain a wealth of professional skills, such as communication and project management, that’ll prepare you to work effectively in industry and government environments. And, if you’re like 80 per cent of our grads, you’ll go on to find professional employment within three months of graduation.
LEARNING WITH THE BEST
When you study with us, you’ll work alongside the people who are changing the future of science. Our researchers are world leaders across a wide range of disciplines, and they’re leading the development of new research discoveries that change the way we live.

Associate Professor Sheila Donnelly is using parasitic worms to fight autoimmune diseases, Professor Liz Harry is investigating medicinal honey as a tool to treat multi-drug-resistant infections, and Professor Peter Ralph is driving a huge program of algae-based biotechnology innovation through the Deep Green Biotech Hub. These are just a few of the superstars who call UTS Science home.

As well as being committed to changing the world, they’re also dedicated mentors of tomorrow’s research leaders, ready to guide you down the path of an academic career.

RESEARCH STRENGTHS
Our research is grouped into research priority areas, known as research strengths, research centres, and faculty research teams. All of these groups are part of either the School of Life Sciences or the School of Mathematical and Physical Sciences.

\( \text{three institute (infection, immunity, innovation)} \): addresses key challenges in the understanding and control of infectious disease in humans and animals.

Climate Change Cluster (C3): uses technology to measure and predict the structure, function and health of plant-based ecosystems.

Centre for Forensic Science: incorporates an interdisciplinary research approach to address crime and security issues.

Centre for Health Technologies: conducts research into health and disease processes; biomedical engineering; and detection and diagnosis of a range of disease states.

Centre for Clean Energy Technology: focuses on the development of efficient devices for energy harvesting, storage, and conversion.

Institute for Biomedical Devices (IBMD): aims to transform advances in photonics and materials into revolutionary biomedical technologies.

Centre for Neuroscience and Regenerative Medicine: aims to initiate, implement and coordinate projects across UTS and beyond that aim to understand central nervous system (CNS) function and improve quality of life for people with CNS disorders.

JOINT RESEARCH CENTRES
- ARC Centre of Excellence for Mathematical and Statistical Frontiers (ACEMS)
- Automotive Australia 2020 Cooperative Research Centre
- Centre for Health Technologies
- Centre for Clean Energy Technology
- Institute for Biomedical Devices (IBMD)
- Institute of Biomedical Engineering
- Institute for Neuroscience and Regenerative Medicine
- ARC Research Hub for Integrated Device for End-user Analysis at Low-levels (IDEAL)
- Rail Manufacturing Cooperative Research Centre
- CSIRO Marine Coastal Carbon Cluster
- Research at UTS Science
Doctor of Philosophy

Make a meaningful contribution to knowledge with a Doctor of Philosophy in science or maths.

You’ll pursue a unique research project that answers critical questions, drives new fields of enquiry, or transforms the accepted wisdom in your chosen field. You’ll develop your findings into a formal thesis under the guidance of experienced supervisors. A PhD can be the first step in an academic career, or an opportunity to take a deep dive into your intellectual passions.

HOW IT WORKS
As well as pursuing an intensive program of research, you may also need to enrol in research development subjects that’ll help you build skills in methodology or otherwise support your academic or professional growth. All your studies will be documented in a formal graduate research study plan, which will help you track your progress and set goals throughout the PhD. You’ll also submit a progress report at the end of each session and complete an annual assessment task to make sure your degree and development remain on track.

ADMISSION REQUIREMENTS:
To enrol in a PhD, you’ll need to have completed either an Honours degree class 1 or 2(1); or a recognised research master’s degree. You’ll also need to demonstrate the quality of your proposed research project, and to identify a supervisor with relevant expertise who is willing and able to supervise your work. Depending on the subject of your PhD, you may also need to demonstrate specific technical skills to ensure your readiness to take on the work.

ADMISSION REQUIREMENTS:
Domestic students should head to uts.edu.au/research-applications for information on how to apply, and international students should head to uts.edu.au/international
See more information on how to apply on page 40.

ANDREW WALTON
PhD in Forensic Science

“I completed a Bachelor of Forensic Biology in Biomedical Science (Honours) at UTS. I really enjoyed the environment and the supervision I received over that time; plus there are only a handful of universities that offer research in the area of forensic science.

Fingerprints are unique to individuals, however all fingerprints can be categorised into three main groups; loops, arches and whorls. I am looking to see if these patterns plus their subcategories, in addition to other features, show a difference in frequency between different ethnicities and the sexes.

My day consists of recruiting volunteers and gathering their fingerprint, DNA and ancestry data. A lot of data crunching on excel then follows, plus a bit of photoshop involving the fingerprint scans. Every now and then I also do DNA extractions and quantifications in the lab.

I hope my research experience will help me transition smoothly into a forensic position where I can make a difference.”
Master of Science (Research)

With a Master of Science (Research), you’ll pursue an in-depth research project in your chosen area of science.

You’ll build fundamental research capabilities and discipline-specific expertise. But this is more than just a research degree – it’s also been designed to give you skills beyond the lab. You’ll advance your professional development by building a range of professional and practical research skills, such as problem definition, hypothesis formulation and testing, data acquisition, analysis and interpretation, and project presentation.

HOW IT WORKS
You’ll work closely with an academic supervisor who specialises in your field of inquiry, and who’ll be accessible and available throughout your research degree. Your main focus will be developing an original thesis that explores a significant research question; your thesis presentation and the thesis itself will be examined at the end of your degree. Not an experienced researcher? Never fear – we’ve got a range of research methodology and professional development subjects that can help you build the skills you need, and that’ll be documented as part of your formal study plan.

ADMISSION REQUIREMENTS
To qualify for the master’s degree, you’ll need:
– A recognised bachelor’s degree, or an equivalent or higher qualification.
– Demonstrated English language proficiency (if you’re an international student, or a domestic student with international qualifications).
– A written research proposal, developed in collaboration with your nominated supervisor.

HOW TO APPLY
Domestic students should head to uts.edu.au/research-applications for information on how to apply, and international students should head to uts.edu.au/international. See more information on how to apply on page 40.

JOSHUA STAINLAY
Master of Science (Research)

“I chose to do a research degree because I wanted to be able to call some research my own before working on a project for somebody else. This is the perfect way to achieve that.

My research aims to discover which garden plants have low flammability, in order to change what people will plant in their gardens at bushfire interfaces. I chose to focus on this because I have grown up in a bushfire prone area, and after meeting my supervisor in my undergraduate degree (who was already in this area), I decided that was what I was interested in.

I conduct my experiments in the UTS greenhouses where I take care of around 40 plants. I also research on my computer and have weekly meetings with my supervisor. I still have time to train and play AFL outside of university and work one day a week.”
Master of Science (Research) in Mathematical Sciences

Build high-level research skills in your chosen area of mathematics and statistics with a degree that'll prepare you for a wide range of careers.

You’ll be guided by your supervisor to develop an original research thesis, and you’ll build additional expertise by exploring a range of mathematical literature. Want more? You’ll also broaden your professional skills with experience in problem definition, hypothesis formulation and testing, data acquisition, analysis and interpretation, and project presentation.

HOW IT WORKS
You’ll work closely with an academic supervisor who specialises in your field of inquiry, and who’ll be accessible and available throughout your research degree. Your main focus will be developing an original thesis that explores a significant mathematics question; your thesis presentation and the thesis itself will be examined at the end of your degree. Not an experienced researcher? Never fear – we’ve got a range of research methodology and professional development subjects that can help you build the skills you need, and that’ll be documented as part of your formal study plan.

ADMISSION REQUIREMENTS
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See more information on how to apply on page 40.

Learn from the best

STEPHEN WOODCOCK
Senior Lecturer, School of Mathematical and Physical Sciences

An applied mathematician and footy lover, Stephen Woodcock is using his expertise in numbers to develop practical and simple solutions to real-world problems.

Stephen’s research projects have covered a vast range of applications, from improving the design and efficiency of wastewater treatment systems, to understanding and modelling the growth of biofilms on riverbeds.

Currently he’s modelling the biogeography around the Great Barrier Reef, calibrating and analysing data collected to measure ocean health.

Stephen is a keen and committed teacher who mentors high school, undergraduate, postgraduate and higher degree research students. He has a unique ability to communicate how maths can be applied to many life scenarios, and is known for using his love of sport to teach maths to the public.

When Stephen is not conducting research or inspiring students about the applications of maths, you can find him writing articles for The Conversation. He’s explored quirky topics such as predicting the Oscars, where you should aim for a goal in a penalty shootout, and how to win office footy tipping competitions (hint – don’t listen to the experts!).
Effective environmental managers are in increasing demand, and so are the CSARM courses required to get their skills up to speed – but not all CSARM qualifications are created equal.

The UTS CSARM program is the only university-based CSARM program around, and it’s been designed with experienced environmental professionals in mind. You’ll complete five self-contained modules in three days or less, and update your expertise, extend your knowledge base and build connections with colleagues across the field of environmental science as you go.

**HERE’S WHAT YOU GET WHEN YOU STUDY WITH US**
- A UTS Certificate of Attendance or Certificate of Completion (on completion of post-module work).
- Recognition of prior learning for UTS Master of Science by coursework (when you successfully complete the designated post-module work).
- Credit towards consultant certification programs such as the Certified Environmental Practitioner scheme and Engineers Australia CPD program.
- A discount on course fees if you’re a previous graduate of UTS.

For more information or to enrol, head to consitecourses.uts.edu.au

The world of work is changing, technology is creating new opportunities and markets are shifting. So what do you need to stay ahead?

UTS Open courses help you adapt and thrive in the face of these disruptions. You’ll develop knowledge and skills you can use in your work, in your study and to tackle some of life’s bigger questions.

UTS Open draws from UTS extensive postgraduate program and industry connections. Courses take just three to five hours of your time and include fascinating topics such as blockchain and copyright and human rights.

UTS Open will soon have some longer courses too, with some that may attract credit towards UTS degrees.

A small step can lead to big change, so head to open.uts.edu.au to discover a new passion today.
THE ACADEMIC YEAR
There are three teaching sessions at UTS:

– Autumn Session: March to June
– Spring Session: July to October
– Summer Session: November to February

While not all subjects offered by UTS are currently run during Summer session, make sure you check out which ones are – it’s a great way to get ahead or to reduce your study load during Autumn and Spring Sessions.

APPLICATION CLOSING DATES
If you want to start studying at UTS in either the Autumn or Spring sessions, you need to apply by:

– Autumn session: 31 January 2019
– Spring session: 28 June 2019

LOCAL APPLICANTS:

COURSEWORK
In a postgraduate by coursework degree you’ll attend tutorials and lectures, and do assessments, like writing essays and exams. Submit your application for a postgraduate by coursework degree online:

– through the UTS Online Application system at uts.edu.au/pg-admissions, or
– at one of our Postgraduate Expos or postgraduate information sessions. Find out everything you need to know about upcoming information sessions at uts.edu.au/dab-events

LOCAL APPLICANTS: RESEARCH
A postgraduate by research degree will see you undertake and complete a research project. Before you submit your application though, you’ll need to consider what you want to research, write a research proposal and find a supervisor. When you’ve done that, send your application to the UTS Graduate research School.

Visit uts.ac/apply-for-research or email grs@uts.edu.au to find out more about the application process and to apply.

INTERNATIONAL APPLICANTS
If you’re an international student, head to uts.edu.au/international to find the course information, fees and application details relevant to you.

NON-AWARD STUDY
Do you want to study a single subject without committing to a full degree? You can! It’s called non-award study and it’s a great way to upgrade your skills or just learn more about something you enjoy. What’s even more exciting is that any subjects you complete may be recognised in future study. To apply, visit uts.ac/non-award-study

ENGLISH LANGUAGE PROFICIENCY
There are English language proficiency requirements for all courses. These requirements may apply to you, even if you are not an international student.

Visit uts.edu.au/english-language-requirements to find out more.

TIMETABLE INFORMATION
Do you like to plan ahead? Then check out the UTS Timetable Planner. The online tool lets you see the timetable for the current session, so you can get an idea about when the subjects for your degree may be scheduled and offered. The 2019 timetable will be published in mid-October 2018. Visit timetable.uts.edu.au

RECOGNITION OF PRIOR LEARNING (RPL)
If you receive a UTS offer of enrolment, and you’ve undertaken previous studies at another institution, you may be eligible for RPL. Faculty of Science students may be granted a maximum of eight subject exemptions of which four core subjects may be approved from prior undergraduate study. For further information visit uts.edu.au/recognition-prior-learning

OFFERS
UTS will begin making postgraduate offers for 2019 from 18 September 2018.

FEES
If you’re studying a postgraduate by coursework degree, you’ll need to pay tuition fees. You can find out more about what your degree will cost at uts.edu.au/tuition-fee-calculator

For postgraduate by research degrees, you will need to either pay a fee or, if you’re eligible for the Research Training Program, the Australian Government will cover the cost for you. To find out more visit uts.edu.au/domestic-hd-fees

If you do have to pay a fee and you’re a local student, you may be eligible for FEE-HELP, an Australian Government loan scheme. Using FEE-HELP means you don’t have to pay for your tuition fees up front. More information can be found at uts.edu.au/government-help-schemes

You can choose to repay your FEE-HELP loan simply by notifying your employer who will then withhold your payments through the PAYG tax system. You can also make payments directly to the Australian Taxation Office (ATO).

ALUMNI ADVANTAGE
If you’ve already completed a degree at UTS then you’re eligible for the Alumni Advantage program, which offers a 10% savings on full fee paying degree programs. Find out if you’re eligible for Alumni Advantage at alumni.uts.edu.au/advantage

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No. 1
UTS ranked
Australia’s
#1 young* uni
