DISCOVER A SCIENCE DEGREE WITH ALL THE ANSWERS

WHAT IS SCIENCE?

No other field has as much potential to make a difference and improve the way we live.

And it’s not all Bunsen burners and lab coats either. Science is about exploration and discovery – both in the lab and in the field.

From biology to chemistry, maths and physics, every area of science plays an important role in helping us to understand why and how things work.

SCIENCE AT RMIT

Connected, relevant and focused on making an impact, science at RMIT is all about finding your niche while you find solutions.

RMIT’s flexible and specialised programs give you plenty of options and when combined with industry experience, translate into great job outcomes for graduates.

Hands-on practice is fundamental to learning and you’ll complete a work placement or be involved in a research project designed to provide exposure to real-life challenges – making you job ready.

“

A science degree prepares students for a lifetime of critical thinking, a drive to find evidence and an understanding of how our society fits into the broader picture of the world, all of which are invaluable for the development of a prosperous Australia.

Professor Ian Chubb
Former Chief Scientist of Australia
www.chiefscientist.gov.au
FASCINATED BY NATURE?
Discover more about all living things with biology, environmental science and biotechnology, where you can tackle everything from farming to pharmacy products.
LEARN ABOUT
BIOLOGY Page 12
BIOTECHNOLOGY Page 12
ENVIRONMENTAL SCIENCE Page 22

CURIOUS ABOUT THE UNIVERSE?
Physics looks at the smallest subatomic particles and the forces of the universe but if you want to explore a new frontier of science, discover nanotechnology.
LEARN ABOUT
PHYSICS Page 34
NANOTECHNOLOGY Page 32

WANT TO BE AT THE FOREFRONT OF TECHNOLOGY?
A career in chemistry allows you to test and produce anything from penicillin to polythene or if you’d like food for thought, consider the potential of food science.
LEARN ABOUT
CHEMISTRY Page 18
FOOD SCIENCE Page 28

INTRIGUED BY THE POTENTIAL OF NUMBERS?
Mathematics finds patterns and connections and can help to model systems and develop theories and formulas, while statistics can allow you to predict trends by using data to make conclusions. However, if you fancy yourself as a forecaster, analytics can help you see preferences, and anticipate actions.
LEARN ABOUT
MATHEMATICS Page 38
STATISTICS Page 38
ANALYTICS Page 38

INTERESTED IN MAPS AND MODELLING?
Measure, map and model spaces with a career in surveying or discover how location has an impact on the way we interact with the world around us with geospatial science.
LEARN ABOUT
SURVEYING Page 42
GEOSPATIAL SCIENCE Page 42

If you’re interested in all things science.
LEARN ABOUT
APPLIED SCIENCE Page 9
THINK OUTSIDE THE LAB

At RMIT you’ll go beyond the classroom and apply what you’ve learned to real-life problems.

You’ll gain hands-on experience working in teams during field studies and excursions, locally and internationally. Projects that involve community groups or companies allow you to put your skills into action and make an impact before you graduate.

These include local field trips to Lakes Entrance, mapping the environment at Camp Jungai, exploring the aquatic environment at Lizard Island or even going overseas to tackle environmental challenges in China.
CAMP JUNGAI

For more than 30 years RMIT second- and third-year surveying students have travelled to the Rubicon Valley in regional Victoria to gain intensive practical experience.

The field camps allow students to carry out a range of projects in cadastral, topographic, geodetic and engineering surveys.

www.youtube.com/watch?v=A6GVn3ODfyQ

LAKE ENTRANCE FIELD PROJECT

In the final year of the environmental science degree students undertake field studies at Lakes Entrance.

The diversity of environments in and around Lakes Entrance in south-eastern Victoria gives RMIT environmental science students a valuable opportunity to put their skills to the test. Students spend four days undertaking extensive field work designed to simulate the work environmental scientists do.

Working in teams, students collect data on a range of environmental parameters, which they collate and analyse at RMIT’s laboratory at Bullock Island. Over the course of the field trip students conduct an index of stream analysis along the Tambo River, collect specimens and take water samples and measurements across Lake King.

CHINA ENVIRONMENTAL TOUR

The RMIT China environmental challenges study tour provides an opportunity for students to receive an international perspective on a relevant environmental issue.

Students hear firsthand from experts working on real issues that are affecting the country and collect data and other useful information to develop their own plan to approach these problems through engineering and policy-based solutions.

The itinerary includes an opportunity to see China’s engineering mega-projects in the South-North water transfer project and the groundwater monitoring and research station of the Chinese Geological Survey.
RESEARCH AND FACILITIES

Research at RMIT is all about solving global problems and finding solutions that change the world for the better.

RMIT’s equipment and facilities are purpose-built and readily accessible. These include the $32 million state-of-the-art biosciences facility that houses world-class equipment for teaching and research and provides a dynamic learning environment.

You’ll start using industry-standard equipment and best practice from day one.

RMIT has an international reputation for excellence in scientific research:

- ranked in the top five Australian universities for excellence in key research in science*
- awarded more than $30 million in research funding in 2015
- more than 200 research collaborations with overseas industry and partners

* Source: Australian Research Council.
MICRONANO RESEARCH FACILITY

The $30 million MicroNano Research Facility at RMIT drives leading advances in micro- and nanotechnologies.

The facility brings to Australia the world’s first rapid 3D nanoscale printer and supports projects that span across the traditional disciplines of physics, chemistry, engineering, biology and medicine.

RMIT MICROSCOPY AND MICROANALYSIS FACILITY

The RMIT Microscopy and Microanalysis Facility houses the latest electron microscopy and microanalysis equipment to support research and teaching.

Electron microscopes and specialist instruments provide high magnification imaging and microanalysis capabilities, primarily for the benefit of RMIT staff and students, but also for collaborations with researchers from other universities, research organisations and industry.

ARC CENTRE OF EXCELLENCE FOR NANOSCALE BIOPHOTONICS

The Centre of Excellence for Nanoscale BioPhotonics brings together physicists, chemists and biologists focused on a grand challenge – controlling nanoscale interactions between light and matter to probe the complex and dynamic nano-environments within living organisms.

This science will underpin a new generation of devices capable of probing the response of cells within individuals to environmental conditions or treatment, creating innovative and powerful new sensing platforms.

CENTRE FOR ENVIRONMENTAL SUSTAINABILITY AND REMEDIATION

The Centre for Environmental Sustainability and Remediation works with companies in Australia and internationally to minimise the impact of land, water and air pollution.

Professor Andy Ball leads a team of world-renowned environmental researchers, environmental scientists, engineers and social scientists who are working together to understand and solve difficult environmental and sustainability issues.
A career in science provides an opportunity to understand the world around us and improve our quality of life.

RMIT’s applied science degrees give you the flexibility and freedom to shape your own path and a chance to explore a broad range of scientific disciplines at all levels of study.

Focus on biology, chemistry or physics, or specialise in areas like biotechnology, environmental science, food technology and nanotechnology.

Studying with leading researchers in state-of-the-art facilities means the skills you gain can take you anywhere in the world.
What is applied science?

There are many fields of applied science that focus on specific areas:

- Biology: studies living things, from tiny bacteria through to large plants and ecosystems.
- Chemistry: looks at materials to determine their composition and chemical properties.
- Physics: explores matter and energy, and the interactions between them.
- Food science: is concerned with the handling, processing and storage of food.
- Environmental science: is the study of animals, plants and waterways.
- Biotechnology: is the application of biological principles to develop technologies and products.

What do scientists do?

Scientists use observation and analytical skills to research the world around us. They have strong problem-solving skills that are used to identify solutions to complex problems and communicate their findings with others.

- Biologists observe living systems and conduct studies and experiments to determine how living things interact and behave.
- Chemists conduct experiments to analyse the composition of substances, determine how they react in different environments and create new materials.
- Environmental scientists measure, record and monitor the environment using a mix of disciplines including biology, chemistry, geology, hydrology, meteorology and physics.
- Physicists use theoretical knowledge and experimental results to understand how energy and matter interact. This can range from broad abstract ideas like the origins of the universe to more tangible applications like advanced technology and medical equipment.

Where do scientists work?

Scientists work in a variety of settings in and out of laboratories including:

- medical and research laboratories
- renewable energy organisations
- chemical processing plants
- educational institutions
- government organisations
- in the field

### STUDY AT RMIT

<table>
<thead>
<tr>
<th>BP229</th>
<th>Bachelor of Science (Applied Sciences)</th>
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<tbody>
<tr>
<td>If you’re looking for a flexible science degree then this is your perfect choice.</td>
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<tr>
<td>You’ll have the opportunity to explore different disciplines before choosing your own major and minor areas of study.</td>
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<tr>
<td>Choose to major in applied chemistry, biological sciences or physics or enter the applied sciences general program plan and major in environmental science, biotechnology or food science.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Specialist Mathematics or 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<td><a href="http://www.mit.edu.au/programs/bp229">www.mit.edu.au/programs/bp229</a></td>
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<tr>
<th>BP305</th>
<th>Bachelor of Science (Applied Science) and Bachelor of Business (Management)</th>
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<tr>
<td>You’ll have the technical skills needed to be a practising scientist and the business skills to be an effective manager and leader.</td>
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<tr>
<td>Your management degree will give you a broad knowledge base of business management, and the applied science component allows you to specialise in one of six majors allowing you the flexibility to create an individualised degree.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<tr>
<th>BH101</th>
<th>Bachelor of Science (Dean’s Scholar) (Honours)</th>
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<tr>
<td>If you’re a capable and highly motivated student, this selective degree incorporating an honours year will provide you with advanced research training through hands-on participation in research projects.</td>
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<tr>
<td>Majors are available in biology, biotechnology, chemistry and physics.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 25 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<tr>
<th>AD012</th>
<th>Associate Degree in Applied Science</th>
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<tbody>
<tr>
<td>Get started on a career in the biotechnology, food and biomedical industries with the core laboratory and scientific skills to be eligible for a range of roles within these diverse sectors.</td>
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<tr>
<td>Major streams are available in food science or biomedical science. The program provides a pathway into a range of science-related degrees.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (any) and a study score of at least 20 in Biology or Chemistry; and a study score of at least 20 in any English (except EAL) or at least 25 in English (EAL).</td>
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<tr>
<td><a href="http://www.mit.edu.au/programs/ad012">www.mit.edu.au/programs/ad012</a></td>
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<tr>
<th>C3305</th>
<th>Certificate III in Science</th>
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<tr>
<td>National Curriculum Code: 22219M</td>
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<tr>
<td>Interested in further science study but didn’t complete VCE? This program is designed for mature age students and others looking for an alternate pathway to a tertiary science program.</td>
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<tr>
<td>This program covers core skills across a range of scientific fields including mathematics, biology and chemistry as well as covering general scientific skills such as laboratory practices and interpreting scientific literature.</td>
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<tr>
<td>Prerequisites: You must have sufficient language skills and an educational background suitable for study at certificate III level.</td>
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<td><a href="http://www.mit.edu.au/programs/c3305">www.mit.edu.au/programs/c3305</a></td>
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RMIT - Associate Degree.
“This degree really focuses on the practical aspects of being a scientist as you learn to effectively communicate information to other scientists and the general public through writing and presentation.

“It also allows room for a student to discover and work out things for themselves – which leads to a real sense of achievement.”

Bachelor of Science (Applied Sciences)

BIOMIMICRY

By Daniel Oldfield, PhD (Applied Physics) at RMIT.

Biomimicry is the design and production of materials, structures and systems that are modelled on or inspired by biological entities and processes, which form sustainable solutions to human challenges.

Perhaps one of the most well-known examples of biomimicry is Velcro. Invented by George de Mestral in 1948, Velcro was inspired by the burrs of the burdock plant that were caught in the fur of his dog and in the wool of his socks after trekking through the woods. Upon closer inspection under a microscope, Mestral discovered the hook-like features that allowed the burrs to attach to the fur of animals in order to spread the seeds of the plant.
BIOTECHNOLOGY AND BIOLOGICAL SCIENCES

Discover the science of living organisms and apply that knowledge to develop technology and products that improve our lives.

RMIT’s bioscience degrees focus on practical applications through lab and field work. Teaching and research is supported by well-equipped facilities and strong industry connections.

You’ll be able to focus on the major biological sciences or specialise in biotechnology fields such as molecular biology, bioinformatics, genetics and proteomics.
DR JEFF SHIMETA

Dr Jeff Shimeta is program leader for the Bachelor of Science (Biological Sciences) and was acknowledged in 2015 by RMIT’s Office for Learning and Teaching for his focus on experiential learning.

“In all my courses I take students into the field to observe the environment, to learn field sampling techniques and to collect data for analysis and report writing. Our excursions range from local ponds, saltmarshes and coastal rock platforms to aquaculture farms and the Great Barrier Reef.

“Our degree in biological sciences covers the gamut from molecular and cellular biology, genetics and microbiology, through to plant and animal science, ecology, and specialist areas such as ecotoxicology, biotechnology and marine biology.”

What is biology?

Biology is all about the study of living systems. It covers everything that happens in the living world around us. Biology can work on a very small scale – looking at how each cell in our body interacts with others, how tiny microbes cause disease and devastation, and how there are DNA codes for every visible trait we can see. It also looks at things on a larger scale, like how organs in animals are put together, the relationships between plants, animals, fungi and bacteria, and how living creatures evolved over time.

What do biologists do?

Biologists use the latest tools and techniques in laboratories and the natural environment to study the relationships between living things and understand living systems. Some areas biologists can go on to specialise in include the following:

- Ecosphere: the relationship of living things to each other and to what is around them.
- Marine biology: the study of the ecosystems and environments under the sea.
- Cell biology: the interactions and processes of living cells.
- Biochemistry: the chemistry of living things.
- Evolutionary biology: how living things are related and evolve.
- Genetics: the study of DNA and all the variation seen in the living world.

Where do biologists work?

Biologists work in a variety of areas including:

- medical laboratories
- research laboratories
- marine environments (marine biologists)
- genetics laboratories
- government organisations (biodiversity and environmental policy)

The median starting salary for bachelor graduates (under 25) in the field of biosciences was $49,000.

Source: GradStats, Graduate Careers Australia, 2015.

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<tr>
<th>STUDY AT RMIT</th>
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<tr>
<td>**BP229</td>
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<tr>
<td>You will study the biological diversity of plants, animals and microbes and expand your understanding of the chemical and physical basis of how cells function. You will learn how these biological entities come together in various environments to form ecosystems, and understand how these environments can be disrupted.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<tr>
<td>Campus</td>
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<td>City</td>
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<td>Duration</td>
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<tr>
<td>Full-time 3 years, Part-time may be available</td>
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<td>Selection Mode</td>
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<td>ATAR (2016: 68.00)</td>
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| **BP226 | Bachelor of Science (Biotechnology)** |
| You will study the major biological sciences, including genetics, biochemistry, microbiology, animal and plant science, as well as specialising in bioinformatics, gene technologies and proteomics. As a graduate you could be involved in applying the latest technologies and techniques in molecular biology and genetics to solve a range of problems like diagnosing genes that cause cancer, making crops and livestock less vulnerable to disease and making food safer. |
| Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL). |
| Campus |
| City and Bundoora |
| Duration |
| Full-time 3 years, Part-time may be available |
| Selection Mode |
| ATAR – Not Published |

| **BH087 | Bachelor of Engineering (Chemical Engineering) (Honours) and Bachelor of Science (Biotechnology) double degree** |
| Learn to combine chemical engineering and biotechnology to better manage the environment. Chemical engineers use biotechnology to make products on a large scale. The integrated skills of chemical engineering and biotechnology can be applied to agriculture and natural resource management, as well as a range of biological-based products and processes. |
| Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL). |
| Campus |
| City and Bundoora |
| Duration |
| Full-time 5 years, Part-time may be available |
| Selection Mode |
| ATAR – Not Published |

| **BH090 | Bachelor of Engineering (Mechanical Engineering) (Honours) and Bachelor of Science (Biotechnology) double degree** |
| Combine mechanical engineering and biotechnology to meet the technical and professional challenges in the biotechnology industry. You will be ready to practise as a high-level engineer in the field of mechanical engineering. You’ll also be equipped with skills in genetic engineering, industrial microbiology, molecular agriculture and bioinformatics, and be fully informed of the regulatory, ethical and legal issues in biotechnology. |
| Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL). |
| Campus |
| City and Bundoora |
| Duration |
| Full-time 5 years, Part-time may be available |
| Selection Mode |
| ATAR – Not Published |

= Associate Degree. = Diploma.

**Source:** GradStats, Graduate Careers Australia, 2015.
What is biotechnology?
Biotechnology looks for ways to use biology to solve real-life problems. It is all about looking at a living system and how we can use it to help create better medicines, improve the environment, or find safer, more sustainable ways to create food and cure diseases. Biotechnology is the key to solving some of the biggest challenges we face today.

What do biotechnologists do?
Biotechnologists use cutting-edge techniques and equipment to study and manipulate living organisms for research and product development. Some areas biotechnologists can go on to specialise in include:

- Ecotoxicology: how chemicals affect the environment and the organisms living in it.
- Environmental biotechnology: using microbes and biological systems to tackle environmental problems like climate change.
- Agricultural biotechnology: developing more productive plants and animals.
- Pharmaceutical biotechnology: vaccine development and production.
- Bioinformatics: taking biological information and data to model living systems.

Where do biotechnologists work?
Biotechnologists work in a variety of fields including:
- medical research laboratories
- hospitals
- industrial manufacturing
- agricultural research industry
- government departments (eg, CSIRO)

STUDY AT RMIT

BP293 | Bachelor of Science (Biotechnology) and Bachelor of Biomedical Science | double degree
Gain an insight into human, plant and animal biology as you explore ways to improve health and treat disease.

Biomedical science courses allow you to understand how the body functions, and the responses of the body to various diseases, exercise, diet, internal disturbances and environmental influences. You’ll learn how techniques in molecular biology and genetics are applied to problems including diagnosing genes that cause cancer, making crops and livestock less vulnerable to disease, and making food safer.

Prequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

www.rmit.edu.au/programs/bp293

AD012 | Associate Degree in Applied Science
Get started on a career in the biotechnology, food and biomedical industries with the core laboratory and scientific skills to be eligible for a range of roles within these diverse sectors. Major streams are available in food science or biomedical science. The program provides a pathway into a range of science-related degree programs.

Prequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (any) and a study score of at least 20 in Biology or Chemistry; and a study score of at least 25 in any English (except EAL) or at least 25 in English (EAL).

www.rmit.edu.au/programs/ad012

C5283 | Diploma of Laboratory Technology (Pathology Testing)
National Curriculum Code: MLS50109
Develop the skills needed to become a technician in pathology laboratories in private laboratories and hospitals through this vocationally-oriented program.

As a medical laboratory technician or assistant, you’ll conduct routine laboratory tests for pathologists, microbiologists/bacteriologists, biochemists, clinical chemists, pharmacologists or veterinarians.

www.rmit.edu.au/programs/c5283

C5282 | Diploma of Laboratory Technology (Biotechnology)
National Curriculum Code: MLS50109
Specialise in molecular biology, develop a broad-ranged knowledge of scientific principles and gain practical laboratory experience as you start your career in the diverse biotechnology industry.

You will provide technical support to scientists working in research, production and testing positions in government and commercial laboratories.

www.rmit.edu.au/programs/c5282

You can also study biology or biotechnology as part of the:
- Bachelor of Science (Dean’s Scholar) – biology or biotechnology major – see page 10.
Watch RMIT science students at the Lizard Island Research Station.

www.youtube.com/watch?v=oe9KuxoF4ZM
Perched on the Great Barrier Reef 270km north of Cairns, Lizard Island is a tropical paradise.

The white sands, clear water and pristine reef teeming with marine life are enough to entice anyone to explore the world around them.

But these explorers aren’t holiday-makers – they are RMIT students undertaking field work as part of a special hands-on course based at the Lizard Island Research Station.

The work they do is part of the Field Practicum at Lizard Island Research Station elective and will guide their assignments for the following semester.

Associate Professor Gale Spring, Adjunct Professor in RMIT’s School of Applied Sciences, said the course attracts students from a diverse range of backgrounds, not just from the biological sciences.

“Originally this was set up to be half-scientific photography and half-marine biology, but we often have students from other programs, such as arts programs, Spring said.”

Although the appeal of the week-long course is apparent, the motivations of each student are varied.

Some have a passion in marine biology while others view it as a golden opportunity to expand their horizons and experience something new during the winter break.

Bachelor of Science (Applied Sciences) student Andrea Prouse said she thought it was a unique way to do an elective.

“I came to Lizard Island because of my interests, but I also thought it would be a great way to do a subject,” Prouse said.

“The field trip is different to being on campus; while we’re here we are constantly studying the subject matter.

“It’s intensive, but at the same time the experience is much more relaxed because it’s not so formal.”

The course aims to give students the experience and skills required to undertake and report on a survey of the reef.

Snorkelling and hiking give students both close-up and distant perspectives of the marine environment and the flora and fauna it contains.

Bachelor of Environmental Science student Justin Cerabona said the practicum is more than a biological survey.

“To see the animals and plants that we study in their native habitats and not under the microscope or being dissected is important and amazing because it means we have a better, more rounded perspective when we head back to the classroom.”

Marianne Pearce is one of a handful of people who live on the island to support the research station.

She has seen many groups from RMIT, along with research students and scientists conducting studies on the island, and knows how valuable and enjoyable the experience can be.

“The students can really see what’s out there and being here for a good stretch of time can give them an idea of what they might want to study,” Pearce said.

“No-one ever wants to leave.”
CHEMISTRY

Analyse and manipulate the fundamental components of our everyday world.

RMIT’s contribution to the study and teaching of chemistry spans more than 100 years.

You’ll gain a thorough grounding in chemistry and become a skilled chemist ready to lead innovation in the fields of industrial chemistry, functional materials and nanotechnology, medicinal chemistry or environmental chemistry.
Chemistry is a crime-solver.
Although we can’t see ultraviolet light it can cause chemical reactions that make substances glow and this is used to detect blood and other bodily fluids at crime scenes.

We could revolutionise infection control with a bandage.
RMIT researchers have developed a new antibacterial fabric that can kill a range of infectious bacteria, such as E. coli, within 10 minutes.

The largest living organism on Earth is helping to cure cancer.
Coral reefs seem on unlikely place to find cancer fighting drugs, but the drug Ara-C – essential in chemotherapy for leukemia and lymphoma – was first derived from sea sponges living in a Caribbean reef. Researchers hope to uncover more compounds in the world’s reefs that can treat people with cancer, diabetes, AIDS, heart disease and other illnesses.

“I completed a week’s work experience with Arup, a firm of designers, planners, engineers, consultants and technical specialists who do consultation work for projects around the world.

“I was embedded with their water team on projects such as water purification and reuse. I enjoyed my time there as it gave me an insight into how an engineer can work as a consultant and aid in the design of a structure or process that helps improve people’s lives.”

Bachelor of Science (Applied Chemistry) and Bachelor of Engineering (Chemical Engineering) (Honours)
What is chemistry?

Everything you hear, see, smell, taste and touch involves chemicals. Chemistry is the study of materials to determine their composition and chemical properties. This area of science provides an understanding of the world around us that allows us to create new materials and improve our quality of life.

What do chemists do?

Chemists use a variety of analytical tools to test and research compounds. They conduct experiments to analyse the composition of substances, determine how they react in different environments and create new materials.

Chemists play a vital role in developing many of the everyday products we take for granted and help to sustain and improve our quality of life.

Information gathered by chemists can be used in industrial, mechanical, agricultural and medical environments.

Chemists can specialise in:

— industrial chemistry (design, development and manufacture)
— analytical chemistry (identification and analysis)
— polymers (specialty composites)
— energy sources (solar cells)

Where do chemists work?

Chemistry opens the door to a wide range of jobs in and out of laboratories.

You may work in:

— laboratories
— chemical processing plants
— the field (collecting samples, on-site testing)
— office environments
— educational institutions

Don’t confuse chemists with chemists!

When you go to the chemist you visit a pharmacist, these professionals are focused on the action of drugs on biological systems and their applications for human drug therapy.

STUDY AT RMIT

BP229 | Bachelor of Science (Applied Chemistry)

Study the molecular basis of chemical reactions with the opportunity to put these studies into practice in practical laboratory sessions.

The concepts of inorganic, organic and physical chemistry are applied in analysis, synthesis and detection of chemical substances.

Prerequisites:

Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

www.rmit.edu.au/programs/bp229

BH098 | Bachelor of Science (Applied Chemistry) and Bachelor of Engineering (Chemical Engineering) (Honours) double degree

With a combination of studies in chemistry and chemical engineering, this double degree will put you at the forefront of developing technologies that could change the world.

Learn to combine the chemical, physics and biological sciences and technology for the design and improvement of industrial processes. You’ll know how to make the processing industries work more efficiently and minimise their environmental impact by using less energy and producing less waste.

Prerequisites:

Units 3 and 4 – a study score of at least 20 in Chemistry and in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

www.rmit.edu.au/programs/bh098

You can also study chemistry as part of the:

— Bachelor of Science (Dean’s Scholar) – chemistry major – see page 10.

Dr Michelle Spencer is passionate about chemistry and has been awarded for teaching excellence.

“Chemistry is relevant to so many areas of our lives – from health and medicine to food and climate change. Everything we see is made up of atoms and molecules, and an ability to understand them helps us to improve our way of life by advancing our technological capabilities.”
ENVIRONMENTAL SCIENCE

Investigate ways to reduce human and environmental impacts on the Earth.

At RMIT environmental science is multidisciplinary, encompassing biology, chemistry, geology, hydrology, meteorology and physics. RMIT’s practical programs give you the skills to make real-life change. You’ll gain extensive field and lab work experience, use specialised equipment and collaborate on projects with government, environmental agencies and consultancies. You’ll even have the opportunity to be part of the Vietnam project, or take a field trip to the Great Barrier Reef.
What is environmental science?

Environmental science is the study of the relationship between organisms and their environment. It combines aspects of chemistry, biology and physics that are particularly relevant to studying the local environment.

It focuses on the impact of civilisation on our environment and the development of sustainable solutions for the future.

What do environmental scientists do?

These green detectives investigate air, noise, water and soil pollution.

Environmental scientists measure, record and monitor the environment using a mix of many disciplines including biology, chemistry, geology, hydrology, meteorology and physics. They conduct field work to assess sites and collect samples as well as conducting laboratory experiments to analyse the samples they have collected.

They help develop environmental policies and they work with industry and the community to share their knowledge and encourage integrated solutions to environmental problems.

Where do environmental scientists work?

Environmental scientists often have complex work environments, and often work in:

— laboratories
— the field (site analysis and sample collection)
— mining companies (planning, testing, site rehabilitation)
— government authorities
— educational institutions
— office environments (policy development.

Many graduates work for environmental consultancies where they assist organisations to tackle environmental problems.

What is conservation and land management?

Conservation and land management is all about understanding and managing natural environments.

This can involve managing the use of land to reduce the impact of civilisation as well as rehabilitation of land that has been disturbed for some reason.

What do conservation and land managers do?

Conservation and land managers conduct site assessments to gain an understanding of the local environment. This can include wildlife studies and flora identification. They also work with community groups and industry to implement conservation strategies.

Conservation and land managers implement indigenous land management techniques and monitor and manage water sources.

Where do conservation and land managers work?

Conservation and land managers work in government, community and industry in areas including:

— national parks
— government departments and statutory authorities
— local councils
— tourism operators
— non-profit conservation and landcare groups
— educational institutions

“The Earth is our most valuable resource and by studying environmental science and engineering I can begin to understand its structures and cycles to help preserve it.

“Field work practice in this double degree takes you all around Victoria to places you otherwise might never visit, and you start to appreciate just how amazing the Earth is and how diverse its natural environments can be.”

BETHANY GREEN

Bachelor of Environmental Science and Bachelor of Engineering (Environmental Engineering) (Honours)
**STUDY AT RMIT**

**BP192 | Bachelor of Environmental Science**
This environmental science degree is concerned with the evaluation and management of all aspects of the environment.

Learn about the processes that occur in both natural and degraded environments. You’ll specialise in either environmental chemistry or environmental biology, and one of either environmental engineering, environmental management, instrumental analysis or geospatial science.

Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (any) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).


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<tr>
<th>Pathway</th>
<th>Duration of pathway program</th>
<th>Additional duration</th>
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<tr>
<td>Dip</td>
<td>Conservation and Land Management</td>
<td>2 years</td>
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**BP162 | Bachelor of Environmental Science and Bachelor of Business (Management) double degree**
Combine an understanding of business management with a sound knowledge of the environment.

Environmental science graduates, particularly those working in consulting firms, need a sound knowledge of management principles to implement environmental policy. Business electives give you the opportunity to specialise in areas such as human resources, business computing, marketing, public administration, accountancy or management.

Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (any) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).


**BH096 | Bachelor of Environmental Science and Bachelor of Engineering (Environmental Engineering) (Honours) double degree**
You will be at the science/engineering interface, combining elements of environmental science (understanding the interactions in the environment) with environmental engineering (designing solutions to environmental problems).

A thorough understanding of environmental processes will allow you to develop and implement environmental management systems, waste minimisation and remediation strategies.

Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).


**BP193 | Bachelor of Environmental Science and Bachelor of Environment and Society double degree**
Break traditional disciplinary boundaries and address the most pressing issue of the new century: environmental changes and the ways in which people might respond and adapt to them.

You’ll combine science, policymaking and social change to gain the skills and knowledge to become a leader in sustainability and help protect our natural environment.

Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (any) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).


**CS305 | Diploma of Conservation and Land Management**
National Curriculum Code: AHC51110
Gain the skills used by land managers, park rangers, site assessors, water quality assessors and conservation staff.

You’ll take annual field trips to remote locations and learn how to survey animals and plants, monitor waterways, assess and restore natural sites and undertake cultural studies relating to land management.


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Jessica Frasca shares what she enjoys most about studying the environmental science and environmental engineering double degree at RMIT and her ambitions for the future.

[www.youtube.com/watch?v=XHPyzTgbqXE](http://www.youtube.com/watch?v=XHPyzTgbqXE)

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**PARTNERSHIP WITH COUNCIL GIVES STUDENTS A KEY ROLE IN PRESERVATION**

For over a decade, RMIT conservation and land management students have undertaken regular field trips to the north-east of Melbourne to explore Banyule’s 380 hectares of natural bushland.

The students collect and classify many of the area’s 400 species of indigenous plants, as well as undertake restoration projects where rare or threatened species are managed and maintained.

Council rangers guide students to areas where maintenance and protective practices are in place for vulnerable indigenous plant, helping students to learn about current best practice in high-value conservation.

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**DID YOU KNOW?**

**What can trees tell us about the environment?**

Dendrochronology is the science of counting tree rings to determine a tree’s age and to identify extreme environmental events. Scientists use certain trees to map out sequences of weather patterns. These sequences are used to compare to known events and to help develop baselines for carbon dating. In some regions, dendrochronologists have more than 10,000 years sequenced.

**Air you inhale was exhaled by Cleopatra.**
Watch the Vietnam environment project.

www.youtube.com/watch?v=dA-xgevzh0s
Designed to replicate a professional consultancy practice, the Environmental Sustainability Research Project enables final-year students to apply their knowledge to an environmental issue from a range of perspectives.

Working in a multidisciplinary team, students from environmental science, environmental engineering and environmental (social science) programs spend an intensive two weeks collecting and analysing data before presenting a draft report to the project’s sponsors and key local authorities.

Associate Professor Barry Meehan from RMIT’s School of Science has coordinated the annual project since 2002.

“The project has three main components: the selection of students and planning in Melbourne, data collection in Vietnam, and reporting on the project to clients in Vietnam,” Professor Meehan said.

“Students see firsthand how environmental issues impact cities and communities, and have the chance to make a contribution to research on a real environmental issue in Vietnam.”

Students also practise professional skills such as project planning and management, research and data collection, presentation and public speaking, group facilitation and report writing.

“Creating and sustaining a healthy team environment was crucial to our project’s success,” Bachelor of Environmental Science student Dan Chamberlain said.

“Being a multidisciplinary team, we each had a unique set of skills, knowledge and experience to contribute and by harnessing the power of our differences we were able to overcome each obstacle,” he said.

During their spare time, students are encouraged to explore Vietnam – visiting market places and finding new places to eat. They also participate in organised tours of other villages that are dealing with sustainability issues relevant to their studies.

A range of environmental topics have been investigated – from the municipal solid waste system in Ho Chi Minh City to water resources management in the Hanoi region.

“The highlight of the Vietnam project was the opportunity to travel and work alongside fellow students to investigate pollution and land contamination caused by traditional craft villages,” Bachelor of Environmental Science student Lucinda Trickey said.
FOOD SCIENCE AND TECHNOLOGY

With a food science qualification you can pursue a career in food safety, nutritional analysis, quality management, product development and more.

Studying food science and technology at RMIT gives you plenty of hands-on experience, thanks to our strong links with major food industry companies and our well-equipped laboratories.

Become highly employable in this growth industry in product development, food regulation, quality assurance and research.
Food science and technology is all about large-scale food manufacturing. It uses chemistry, microbiology, engineering and other sciences to study all aspects of food. It involves using laboratory techniques to improve the taste, nutrition, safety and shelf life of processed foods.

Food science and technology also looks at the production, processing, packaging and marketing of a range of food products.

In 2012–13, the Australian food and beverage, grocery manufacturing and fresh produce industry employed almost 300,000 people. Currently, Victoria is the largest employer within the food and beverage, grocery and fresh produce industry, with 31% of all jobs located in the state.

Source: Australian Food and Grocery Council, State of the industry 2014.

**What is food science and technology?**

Food science and technology is all about large-scale food manufacturing. It uses chemistry, microbiology, engineering and other sciences to study all aspects of food. It involves using laboratory techniques to improve the taste, nutrition, safety and shelf life of processed foods.

Food science and technology also looks at the production, processing, packaging and marketing of a range of food products.

**What do food scientists do?**

Food scientists use analytical techniques to test properties of food including nutritional value, flavour and levels of various substances. They also test foods to provide product information, ensure the safety of food products and check that food manufacturing processes meet government and industry standards.

They explore and develop new products and manufacturing methods, conduct sensory evaluation of products and can investigate and set safety and quality standards for production, packaging and marketing. Evaluating the nutritional value of foods is a vital aspect of food science. Nutritionists specialise in studying the health aspects of food as well as food composition, consumption and regulation.

**Where do food scientists work?**

Food scientists can work in:
- large-scale manufacturing (processing, manufacturing, packaging, management)
- office environments (marketing)
- laboratories (research and analysis, development of new products, quality assurance)
- government departments/regulatory bodies (food standards, dietary studies)
- educational institutions (public health programs)

**CHLOE WALKER**

“We learn about the manufacturing processes that drive production. A key focus is food nutrition and it has been really interesting to look at the techniques that apply to diets and dietary requirements. The practical sessions give us the opportunity to apply what we are taught.

“People don’t always have the time or the knowledge to make informed decisions on food’s nutritional qualities. It’s been fascinating to learn about different food types, and explore their elements and values.

“Be prepared to completely change the way you think about food and what we eat!”

Bachelor of Science
(Food Technology and Nutrition)
BP199 | Bachelor of Science (Food Technology and Nutrition)
Learn about the science of large-scale food manufacturing and how to make food safe and nutritious to meet consumers’ needs.
You’ll be prepared to work in a range of roles in the food industry and trained in all the theoretical and practical aspects of food science, technology and nutrition. You’ll also be able to develop novel, healthy and functional food products that meet consumer demands and comply with government and industry’s strict safety and health guidelines.
Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (anyreas) and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).
www.rmit.edu.au/programs/bp199

Pathway Duration of pathway program Additional duration
| Applied Science – Food Science stream | 2 years | 1 year |

BH099 | Bachelor of Science (Food Technology and Nutrition) and Bachelor of Engineering (Chemical Engineering) (Honours) double degree
Prepare for a leading role as a food industry professional by combining food science and engineering in the areas of product development and production systems.
You will develop skills and capabilities relating to large-scale production of food, learning how to design the plant, the process and the product.
Prerequisites: Units 3 and 4 – a study score of at least 20 in Chemistry and in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).
www.rmit.edu.au/programs/bh099

BP289 | Bachelor of Science (Food Technology) and Bachelor of Business (Management) double degree
Gain the technical knowledge to work in the food industry and the management and marketing skills to design and promote innovative products.
Combining food science and business, you’ll have the scientific knowledge essential for advancing technological capabilities, and the international business, economic and financial analytical knowledge to perform high-level management analyses with a global perspective.
Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (anyreas) and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).
www.rmit.edu.au/programs/bp289

AD012 | Associate Degree in Applied Science
Get started on a career in the biotechnology, food and biomedical industries with the core laboratory and scientific skills to be eligible for a range of roles within these diverse sectors. Major streams are available in food science or biomedical science. The program provides a pathway into a range of science-related degree.
Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (anyreas) and a study score of at least 20 in Biology or Chemistry; and a study score of at least 20 in any English (except EAL) or at least 25 in English (EAL).
www.rmit.edu.au/programs/ad012

้ำ 100 = Associate Degree.

RMIT A VITAL LINK IN MELBOURNE’S FOOD MANUFACTURING CHAIN
Melbourne’s food industry is set to double over the next 10 years in a plan that will make the city’s northern region a major food industry hub with the assistance of RMIT’s facilities and expertise.

The Food and Beverage Growth Plan (Melbourne’s North) was initiated by the Northern Melbourne Regional Development Australia Committee and developed in collaboration with project partners NORTH Link, the Australian Government, the Victorian Government, La Trobe University and RMIT University.

The plan outlines a number of strategies to develop the food and beverage processing and trading sectors in the region, with RMIT playing a vital role in providing ongoing research, development and expertise.

CELIA KING
“I love food and I love science. Transforming chemistry into real-life applications intrigues me.”
“RMIT’s food technology and nutrition is a specialised and forward-thinking degree. The practical work and hands-on time in the lab has cemented so many concepts.
“I completed a placement in Tasmania doing research at a state-of-the-art facility that manufactures long shelf-life foods. My project was related to packaging properties, an important and booming area of food manufacturing.
“Food science is so rewarding, with many career pathways – you’re limited only by your imagination.”
Bachelor of Science (Food Technology and Nutrition)

Did you know?
How can you bake bread with a papaya?
Researchers at RMIT are using the enzyme caricain (derived from papaya) to reduce the gluten content of bread and grain-based products so as to reduce the risk of coeliac disease.
RMIT is at the forefront of education and research in the rapidly evolving field of nanotechnology — the science and engineering of materials less than a micrometre.

Reflecting nanotechnology’s multidisciplinary nature, RMIT’s double degree encompasses physical, chemical, biological and engineering nanoscience and nanotechnology.

You’ll have access to specialised facilities, including the MicroNano Research Facility and the Microscopy and Microanalysis Facility.
What is nanotechnology?
Nanotechnology is the study of extremely small things. It focuses on being able to see and manipulate things at the atomic and subatomic level, much smaller than you can see with a regular microscope.

Nanotechnology combines diverse areas of science including physics, chemistry and biology with engineering and allows for new materials and devices to be made with greater durability and efficiency.

What do nanotechnologists do?
Nanotechnologists use precision equipment and find ways to design and manipulate structures at the atomic and subatomic level. They investigate and create materials at the nanoscale level to take advantage of enhanced properties such as higher strength, lighter materials and greater chemical reactivity.

Nanotechnologists manufacture nanomaterials to create new, more efficient medical devices and medicines, and strong lightweight materials for use in construction and aircraft.

Where do nanotechnologists work?
Nanotechnologists work with sophisticated instruments in research laboratories in industrial, academic and science sectors as well as mining, medical, manufacturing and production.

How small are we talking?
A sheet of paper is about 100,000 nanometres thick!

Watch Dr Kay Latham explain how nanotechnology works. www.youtube.com/watch?v=y-Gnm7B69UU

SIGRID WILKENS

“Nanotechnology is a new and emerging field with many opportunities for research and discovery.

“I get to work with million-dollar electron microscopes and high-tech equipment and I’m taught by lecturers who are leaders in their field.

“Working in this field has the potential to really make a difference to our everyday lives.”

Bachelor of Science (Nanotechnology) and Bachelor of Science (Applied Sciences)

STUDY AT RMIT

BP247 | Bachelor of Science (Nanotechnology) and Bachelor of Science (Applied Sciences) double degree
Gain the skills and knowledge to work in a new and rapidly growing area of science.

A multidisciplinary approach combines nanotechnology with physics or chemistry. It covers physical, chemical, biological and engineering nanoscience/nanotechnology with a strong emphasis on using instruments.

Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Chemistry or Physics and in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

www.rmit.edu.au/programs/bp247
Gain a fundamental understanding of life, the universe and everything in between.

RMIT’s research and education degrees explore experimental and theoretical studies in chemical and quantum physics, atomic and molecular modelling, materials sciences, geophysics, optics and medical physics.

You’ll have access to purpose-built facilities to support your learning and research.
What is physics?
Physics is the science of how our universe works and it seeks to explain natural phenomena. It is the study of matter and energy, and the interactions between them. Physics is an extremely broad subject area ranging from subatomic particles to large galaxies and the universe itself.

What do physicists do?
Some physicists use theoretical knowledge to focus on deep, abstract areas such as the origins of the universe. Others apply physics to more tangible applications like the development of advanced materials, electronic devices and medical equipment.

Physicists design and engineer materials, machines and systems capable of imaging and manipulating single molecules and atoms that allow for nanotechnology. They are valued for their broad knowledge, problem-solving and strong experimental skills.

Where do physicists work?
Physicists work with sophisticated instruments in research laboratories in industrial, academic and science sectors. Many physicists are employed in renewable energy, medical and space science fields.

You could work for a government research facility, small or large business or an educational institution.

Flexible electronics are set to become a multimillion-dollar industry, with wearable devices such as fitness trackers and smartwatches appearing recently in the mainstream market.

Currently, such devices use rigid conventional electronic elements embedded into elastomeric materials to allow the device to bend.

Research at RMIT has led to the discovery of the micro-tectonic effect, where micron-scale plates of the oxide materials are generated through cracking introduced during the fabrication process. The plates slide over each other, much like geological plates, relieving stress while retaining electrical functionality during stretching.

A teaspoon of neutron star weighs more than everyone on Earth combined.

Radio waves were first generated by Heinrich Hertz.
He made sparks jump across a gap of air using high-voltage alternating current and essentially built the first ever radio transmitter and receiver in 1888.
“I enjoy the discipline of physics and like to delve into the mysteries of the universe. “This degree offers an opportunity to specialise in a particular area of study that I find fascinating. It has taught me a broad range of skills and qualities including problem-solving, time management and teamwork, which are invaluable in the real world of science and research.”

Bachelor of Science (Physics)
Ever found yourself trying to make sense of an infinitely complex world? A maths, stats or analytics degree might just give you the answers you’re looking for.

RMIT’s degrees allow you to apply your knowledge to banking and finance, sports, engineering, environmental modelling, medical research, education and marketing.

An emphasis on work-integrated learning and placements ensures you have the skills to help organisations make informed, data-driven decisions.
What are mathematics, statistics and analytics? Mathematics is the study of patterns and structures. It affects everything we do in our lives and provides a language of expression and description that enable calculations, reasoning and understanding.

Statistics and analytics is all about collecting and analysing data to draw conclusions, see preferences and make predictions. It’s a mathematical science used in areas like biology, business, economics, engineering, medicine, public health, psychology, marketing, education and professional sport.

What do mathematicians, statisticians and analysts do? All work with data to interpret it and express complex situations in a logical way they also use modelling to predict future events and needs.

They design surveys and collect, process, analyse and interpret data to determine what information is reliable and which predictions can be trusted.

They build and use models to understand and forecast natural phenomena; represent, analyse and optimise complex systems; support decisions; and find efficient and innovative solutions to complex real-life problems.

Where do mathematicians, statisticians and analysts work? They can work in a range of areas including:

- business and finance
- environmental modelling
- information technology and security
- government departments
- market research
- sports analysis
- logistics and transport
- education and research
- health

“The degree focuses on applying mathematical theory to and using industry software in real-life work scenarios. These skills ensure I’ll be work ready when I graduate.

“The highlight of my studies has been my CSIRO placement was very rewarding to see how my knowledge and skills can be applied on a real project.

“My aim is to predict future fire occurrences in Victoria based on historical data and I know my degree will get me closer to my goal.”

Bachelor of Science (Mathematics)

BORCE KOTESKI

Did you know...
Associate Professor Dr Melih Ozlen explains how an analytics degree can provide vital skills for the digital age.

“Access to an increasing amount of data is revolutionising the way we do business.

“Analytics is the science and art of analysing data to make better informed decisions. It builds on the tradition of statistics and operations research, bringing together tools and expertise from computer science, engineering and business.

“This blend of disciplines makes analytics unique in its capacity to solve critical real-life problems.

“With the increasing availability of data from sources including smartphones, smartwatches and the Internet of Things, there will always be analytics opportunities from which to derive insights.

“The methods and tools may change over time due to the change in the magnitude of data that needs to be processed, but the need to make better informed decisions will always be there.

“Analytics enables people to make significant contributions to their organisations and opens the door to many rewarding and valued careers.”

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<tr>
<th>BP083</th>
<th>Bachelor of Science (Mathematics)</th>
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<tbody>
<tr>
<td>Campus</td>
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<td>Duration</td>
<td>Full-time 3 years, Part-time may be available</td>
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<tr>
<td>Selection Mode</td>
<td>ATAR – Not Published</td>
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<tr>
<td>RMIT offers one of the only stand-alone applied mathematics degree in Australia. Focus on applying maths to real-life problems to enhance your employment prospects. You will undertake core studies in applied mathematics and build your own profile in areas such as finance, information security, statistics or environmental modelling. Theory is linked to practical projects and applied to real scenarios. You’ll also learn to use industry-relevant computer software packages and programming tools.</td>
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<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<th>BP245</th>
<th>Bachelor of Science (Statistics)</th>
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<td>Campus</td>
<td>City</td>
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<tr>
<td>Duration</td>
<td>Full-time 3 years, Part-time may be available</td>
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<tr>
<td>Selection Mode</td>
<td>ATAR – Not Published</td>
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<tr>
<td>Statistics is the mathematical science of collecting and analysing data to draw conclusions and make predictions. By studying statistics at RMIT, you’ll learn to use a number of industry-relevant computer packages and gain the skills and knowledge to apply statistics to a broad range of industries.</td>
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<td>This degree – one of the only stand-alone statistics degrees offered in Australia – is highly regarded for its industry engagement and employment focus. RMIT statistics graduates are prized for their hands-on IT literacy, problem-solving skills and exposure to real-life statistical problems.</td>
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<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<th>BH119</th>
<th>Bachelor of Analytics (Honours)</th>
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<td>Campus</td>
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<tr>
<td>Duration</td>
<td>Full-time 4 years, Part-time 8 years</td>
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<td>Selection Mode</td>
<td>ATAR – Not Published</td>
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<tr>
<td>Gain skills in analytics by combining studies in statistics, operations research, computer science, IT, business, economics, finance and marketing. You will have the flexibility to choose from a diverse range of electives combined with a core of statistics and operations research, enabling you to specialise in the areas that interest you most.</td>
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<tr>
<td>Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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The Bureau of Meteorology is a big employer of mathematics graduates.

We all know that the weather is hard to predict. The modelling of ocean currents, weather patterns and climate change is all about mathematics.

Statistical analyses play a key role in health research and in the development of new therapies.
Surveying and geospatial science at RMIT actively engages with industry to ensure our programs meet the needs of this rapidly expanding field and our graduates are in high demand.

Using modern day devices such as GPS, professionals trained in the geospatial sciences map where things are and how they connect.

Surveying applies geospatial principles to provide essential information for land development and major infrastructure projects.
Surveying

**What is surveying?**

Surveying focuses on measurements that describe the Earth. It applies principles of geometry, physics, engineering and law to describe both the natural and human-made features of the Earth. Surveying allows us to define and measure boundaries, to calculate distances and to track movement.

**What do surveyors do?**

Surveyors use specialist equipment to perform a variety of measurement surveys, big and small. They measure distances and angles using lasers, scan buildings to millimetre precision and use satellite positioning technology to accurately determine locations across the continent and around the world.

Surveyors can tell you where your property ends and your neighbour's begins, including the features on the land as they are and as they can be constructed.

Surveying has a number of fields including:

− Cadastral: defining boundaries and legal rights when land is subdivided, bought or sold.
− Engineering: providing surveys essential to design and construction of dams, roads, multi-storey buildings, bridges and other structures.
− Geodesy: measuring and understanding the Earth's geometric shape, orientation in space and gravity field.
− Hydrographic: mapping the sea floor, shipping channels, waterways, ports, shorelines and other marine features.
− Mining: monitoring and measuring mines, tunnels and other underground and surface works.

**Where do surveyors work?**

Surveyors work in a range of areas including:

− land development
− construction
− mining
− corporate consultancy
− government agencies

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**STUDY AT RMIT**

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<th>Program</th>
<th>Bachelor of Science (Geospatial Science) (Honours)</th>
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<tr>
<td>BH117</td>
<td>Be prepared for a career in interpreting how location has an impact on the way we interact with the world around us. You'll study the fundamentals of measurement science, cartography and GIS. Specialised studies are offered in spatial analysis, web design, remote sensing, image analysis and professional practice. Practical work is based on industry-standard software and hardware to reinforce theoretical learning. Prerequisites: Units 3 and 4 – a study score of at least 20 in mathematics (any) and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
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<tr>
<td>Pathway</td>
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<td>Duration</td>
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<tr>
<th>Program</th>
<th>Bachelor of Applied Science (Surveying) (Honours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH116</td>
<td>RMIT offers the only surveying degree in Victoria. You'll study the fundamentals of measurement science, cartography and GIS. Specialised studies are offered in geodesy, remote sensing, image analysis, cadastral and engineering surveying, GPS, advanced adjustment methods and professional practice. Practical work is based on industry-standard software and hardware and field camps reinforce theoretical learning. Prerequisites: Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics, and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).</td>
</tr>
<tr>
<td>Pathway</td>
<td>Surveying</td>
</tr>
<tr>
<td>Duration</td>
<td>2 years</td>
</tr>
<tr>
<td>Additional duration</td>
<td>3 years</td>
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<table>
<thead>
<tr>
<th>Program</th>
<th>Advanced Diploma of Surveying</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6129</td>
<td>National Curriculum Code: CPP60312 Further your knowledge in drafting, project management, detailed surveying equipment use, monitoring and quality control. You'll focus on developing your practical experience using industry-standard equipment. Using various surveying technologies and software for electronic data capture, processing and presentation, you'll take part in land development exercises and learn cadastral surveying (surveying relating to land ownership and property boundaries) in a project environment. Prerequisites: Diploma of Surveying.</td>
</tr>
<tr>
<td>Pathway</td>
<td>Surveying</td>
</tr>
<tr>
<td>Duration</td>
<td>2 years</td>
</tr>
<tr>
<td>Additional duration</td>
<td>3 years</td>
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<table>
<thead>
<tr>
<th>Program</th>
<th>Diploma of Surveying</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5320</td>
<td>National Curriculum Code: CPP50112 Develop the educational and practical training for a career in the surveying, mapping and GIS industries.</td>
</tr>
<tr>
<td>Pathway</td>
<td>Surveying</td>
</tr>
<tr>
<td>Duration</td>
<td>2 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program</th>
<th>Certificate IV in Surveying</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4336</td>
<td>National Curriculum Code: CPP40112 This program is available as either a traineeship or non-traineeship program. Learn how to use surveying technologies and software to capture, process and present electronic data, and gain practical experience with industry-standard equipment. As a graduate, you'll be ready for a career in the surveying, mapping and geographical information systems (GIS) industries.</td>
</tr>
<tr>
<td>Pathway</td>
<td>Surveying</td>
</tr>
<tr>
<td>Duration</td>
<td>2 years</td>
</tr>
</tbody>
</table>

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**JON ALLEMAND**

“...The degree provides relevant practical experiences that are similar to the workplace, while offering an opportunity to gain a thorough understanding of spatial theory. I have particularly enjoyed the remote sensing and photogrammetry course, which taught us to use aerial and satellite imagery for precise spatial analysis of the Earth. “I was able to continue my work as a surveyor throughout my studies which helped to reinforce the learning.”

Bachelor of Applied Science (Surveying) (Honours)
What is geospatial science?

Geospatial science is all about location. If we understand where things are and how they are connected, we better understand our world.

It mobilises information collected from many sources and technologies. This science organises the data using Geographical information systems (GIS) and applies analytical methods and cartography to visualise alternatives.

Geospatial science is everywhere around you – from satellite images on your phone, to smartphone maps that tell you the shortest route to your destination, to flight instruments that assist pilots to navigate around the world.

What do geospatial scientists do?

Geospatial scientists create maps of all types and develop dynamic interactive visualisations for thousands of applications. They also work in 3D with measurements of elevation for dam and mine surveys, as well as urban infrastructure.

They access Earth observation satellites to explore and monitor marine systems, to understand and predict bushfires or to track changes in land use and resources, and participate in the planning and management of urban growth, infrastructure, natural resources, coastal zones, disaster risk reduction and scientific research.

Where do geospatial scientists work?

Geospatial scientists work in:
- software development companies
- conservation agencies
- environmental consultancies
- scientific research organisations
- federal, state and local government
- demographic marketing companies
- mining groups
- emergency service

CLAIRES KNAUTH

“I completed eight weeks’ work experience at the Department of Economic Development, Jobs, Transport and Resources updating shoreline segmentation and shoreline access point data, which is used to survey the shoreline during an oil spill.

“This experience benefitted me greatly, not only opening my eyes to the type of work I could do once I graduate, but also providing valuable experience in the industry.”

Bachelor of Science (Geospatial Science) (Honours)

Did you know?

We need more surveyors!

Demand for cartographers and surveyors is expected to grow strongly over the next two years* with an average graduate starting salary of $52,000.

Surveyors get great money and travel the world. What’s more, Australia can’t get enough of them – we don’t have enough young surveyors to meet future demand.

* Source: Job Outlook Occupational Bulletin (ANZSCO 2322).
PATHWAYS

At RMIT, there’s more than one way to reach your goal.

Associate degrees and advanced diplomas provide a range of study options to help you get where you want to go.

Associate degree
— Associate Degree in Applied Science
Pathways to Bachelor of Science (Biological Sciences) or Bachelor of Science (Biotechnology).

Advanced diploma
— Advanced Diploma of Surveying
Pathways to Bachelor of Science (Biological Sciences) or Bachelor of Science (Biotechnology).

Diploma
— Diploma of Laboratory Technology (Biotechnology)
— Diploma of Laboratory Technology (Pathology Testing)
Pathway to Bachelor of Science (Biotechnology).

Certificate
— Certificate III in Science
Pathway into the Certificate IV in Tertiary Preparation (Science stream), which then pathway to the diplomas.

A CONNECTED COMMUNITY

RMIT’s strong links and collaboration with industry become part of the student experience.

You will actively engage with industry to ensure that you’ll always be learning the most relevant and in-demand skills for a constantly evolving world.

RMIT students have undertaken work placements and collaborative projects with the Victorian Institute of Sport, Bureau of Meteorology, BP, Cadbury, Cryovac, CSL, CUB, ExxonMobil, Kraft Foods, Moldflow, Rio Tinto, just to name just a few...
**HOW TO APPLY**

Before applying for a program at RMIT, refer to the program information available at www.rmit.edu.au/study-with-us. All the information you need to apply is at www.rmit.edu.au/study-with-us/applying-to-rmit.

**CURRENT YEAR 12 STUDENTS**

If you are a current Year 12 student applying for Semester 1, you must apply through VTAC for all programs except some that are certificate III and below, which may require you to submit an RMIT school-based application.

**NON-YEAR 12 STUDENTS**

If you are a non-Year 12 student applying for Semester 1, you must apply for degrees and associate degrees through VTAC but have the choice of applying for certificate IV, diploma and advanced diplomas either through VTAC or direct to RMIT. Please select one application method only.

RMIT STUDENTS AND RECENT GRADUATES

Current RMIT students and recent graduates can fast-track their application for a new program by applying direct to RMIT as an internal applicant.

**MID-YEAR ENTRY (SEMESTER 2)**

Not all RMIT programs will accept applications for mid-year entry. A list of programs accepting mid-year applications is published in May on the RMIT website (www.rmit.edu.au/midyear).

**SELECTION TASKS**

Many programs at RMIT have selection tasks as part of the selection process, such as an interview, a test, a folio, a supplementary form or pre-selection kit. It is very important that you carefully read any instructions to complete a program's selection tasks. Selection tasks are listed under programs on the VTAC or the RMIT websites. These selection tasks are compulsory. Applications without selection tasks will not be considered.

**ENTRY REQUIREMENTS**

To be considered for admission, you must meet RMIT University entry requirements as well as specific program entry requirements. For more information please refer to the program information available on the RMIT website (www.rmit.edu.au/study-with-us).

**STUDY SCORES**

Study scores listed in this guide are subject to change.

### HOW TO APPLY

<table>
<thead>
<tr>
<th>How To Apply by Program and Student Type</th>
<th>Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree and associate degree</td>
<td>Current Year 12 Students</td>
</tr>
<tr>
<td>Certificate IV, diploma, advanced diploma</td>
<td>VTAC application</td>
</tr>
<tr>
<td>Certificate III and below*</td>
<td>RMIT school-based application</td>
</tr>
</tbody>
</table>

*Some certificate III and below programs are administered by direct application. This will be explained in the individual program information available at www.rmit.edu.au/study-with-us.

### FEES EXPLAINED

**TUITION FEES FOR CERTIFICATES, DIPLOMAS AND ADVANCED DIPLOMAS**

The tuition fees you pay depend on whether you are offered a Victorian Government–subsidised place or a full-fee place, based on the eligibility criteria.

**Victorian Government–Subsidised Places**

For eligible students, this training is delivered with Victorian and Commonwealth Government funding.

Tuition fees for a government-subsidised place vary according to each program. For a full list of program fees for a government-subsidised place visit www.rmit.edu.au/programs/fees/vocational/govtsub.

You will be offered a government-subsidised place if you meet the eligibility criteria based on your citizenship, age, prior education, the number of programs you are studying in the current year and the number of government-subsidised programs you have commenced in your lifetime at each level.


If you are applying for a government-subsidised place, you will be required to provide documentation to establish your eligibility.

You will be enrolled according to how qualifications are defined in the relevant industry training package. This may impact on your eligibility for a government-subsidised place for individual qualifications. For more information visit www.rmit.edu.au/programs/apply/vocational/eligibility.

RMIT University's Registered Training Organisation (RTO) code is 3048.

**Fee Concession**

You may be entitled to a concession on your tuition fees if you are in a government-subsidised place and you meet the eligibility criteria.

For more information about the eligibility criteria and how to apply visit www.rmit.edu.au/programs/fees/vocational/concession.

Fee information relates to 2017 and should only be used as a guide. Fees are set on an annual basis and may be subject to change each calendar year.

**FULL-FEE PLACES**

If you do not meet the criteria for a government-subsidised place, you will be offered a full-fee place. Tuition fees for a full-fee place vary according to each program. For a full list of program fees for full-fee places visit www.rmit.edu.au/programs/fees/vocational/fullfee.

Financial assistance may be available through the VET Student Loans scheme.

**VET Student Loans**

Subject to the passage of legislation, VET Student Loans will commence on 1 January 2017, replacing the current VET FEE-HELP scheme. Information about the new program can be found at www.education.gov.au/vet-student-loans.

**TUITION FEES FOR DEGREES AND ASSOCIATE DEGREES**

Commonwealth Supported Places (CSP)

A Commonwealth supported place is a place at university where the tuition fee is jointly paid by you and the Australian Government. Your share of the fee (student contribution) is set by the government and is determined by the discipline areas (bands) of your individual enrolled courses, not the overall program. For more information about what fees you will pay in 2017 visit www.rmit.edu.au/programs/fees.

**HECS-HELP**

You may be eligible to defer payment of the student contribution through the HECS-HELP loan scheme if you are an Australian citizen or holder of an Australian Permanent Humanitarian Visa. You must pay your student contribution up front if you are a New Zealand citizen or permanent resident (other than Australian Permanent Humanitarian Visa holder). For more information visit www.rmit.edu.au/programs/fees/helploans/hecs-help.

**FEE-HELP**

FEE-HELP is an optional loan scheme that assists eligible students to defer payment of up to 100 per cent of their tuition fees. To learn more about FEE-HELP visit www.rmit.edu.au/programs/fees/helploans/fee-help.

**Other Fees**

In addition to tuition fees, you will be charged a student services and amenities fee (SSAF). Eligible higher education students will be able to defer payment of the fee through SA-HELP.

For more information visit www.rmit.edu.au/programs/fees/ssaf.

You may also be required to purchase items related to your program, including field trips, specified textbooks and equipment. These expenses vary from program to program.

For more information visit www.rmit.edu.au/programs/fees/other.

**SCHOLARSHIPS**

RMIT offers more than 2000 coursework and research scholarships to vocational and higher education students.

Equity scholarships provide an opportunity for students who have experienced financial or educational disadvantage to achieve their academic goals, while merit scholarships recognise and award outstanding academic success.

www.rmit.edu.au/scholarships
Discover your future in 360°

Wherever you are in the world, you can now explore RMIT in 360° with the Discover RMIT app.

Experience RMIT campus life, explore the learning spaces and catapult yourself into Melbourne city culture. RMIT is ready for you. What are you waiting for?

Download the app today
www.rmit.edu.au/discover

This guide is designed for Australian and New Zealand citizens and permanent residents of Australia.

Further information for international/non-residents of Australia:
RMIT International
Tel. +61 3 8676 7047
(within Australia: 1800 998 414)
Email: isu@rmit.edu.au
www.rmit.edu.au/international

Every effort has been made to ensure the information contained in this publication is accurate and current at the date of printing. For the most up-to-date information, please refer to the RMIT University website before lodging your application. RMIT University CRICOS Provider Code: 00122A. RMIT University Registered Training Organisation code: 3046. Prepared March 2016. 14292 0316