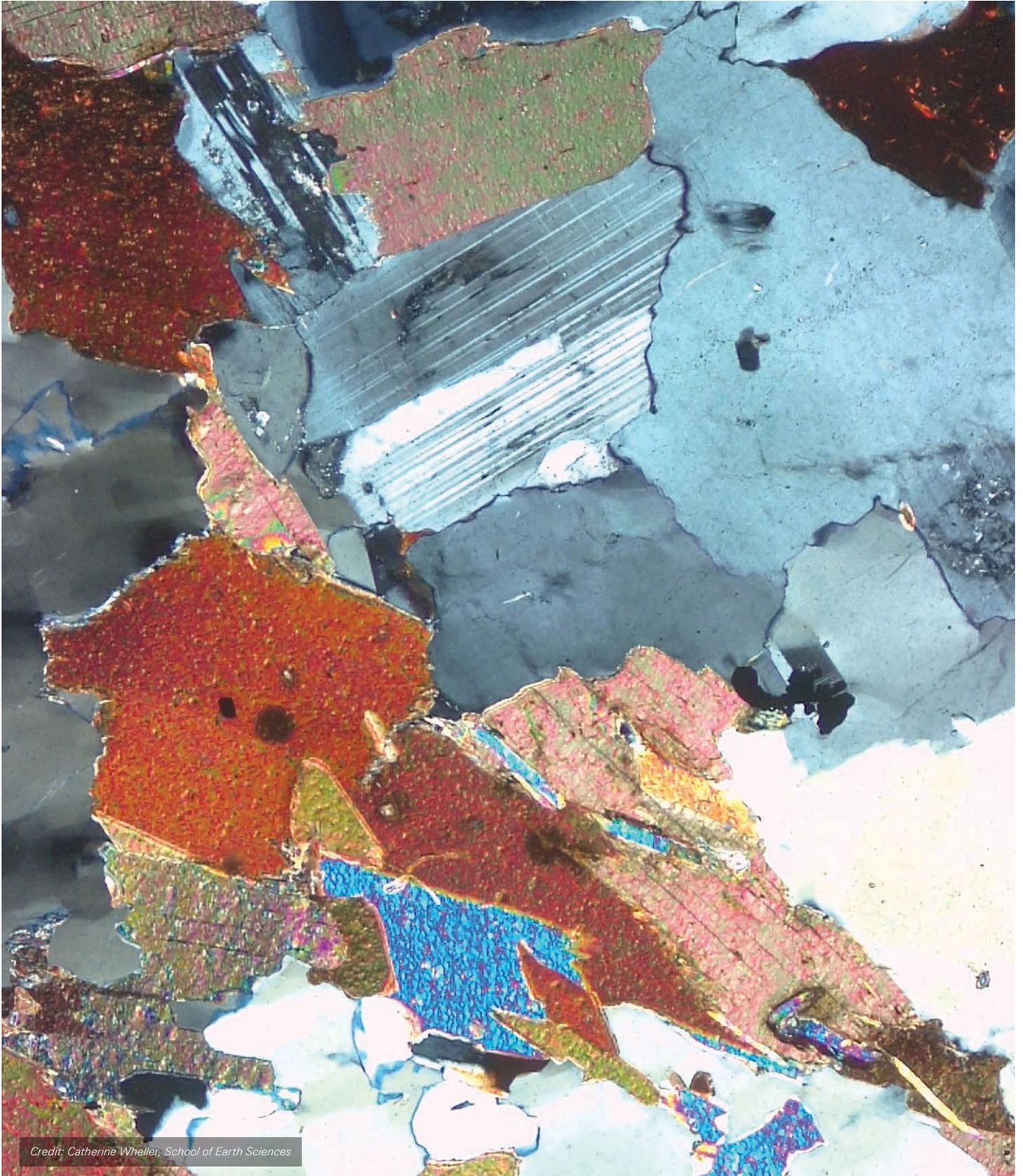




THE UNIVERSITY OF
MELBOURNE

FACULTY OF SCIENCE GRADUATE COURSE GUIDE



Credit: Catherine Wheller, School of Earth Sciences

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WHY CHOOSE SCIENCE AT MELBOURNE?

For over 100 years, the Faculty of Science has been recognised internationally for its role in expanding the frontiers of knowledge for the betterment of society. We attract staff who are at the forefront of their respective fields to teach the best and brightest students with a passion for science.

RANKINGS

No1

in Australia for
Biological Sciences,
Computer Science &
Information Systems, and
Physics & Astronomy*

No13

in the world for
Computer Science &
Information Systems*

No2

in the world –
Best Student City*

No15

in the world for
Environmental Sciences*

*QS World University Rankings, 2016

MORE INFO

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science-matters

PROFESSOR KAREN DAY, DEAN OF SCIENCE

Professor Karen Day has been Dean of Science at the University of Melbourne since 2014, bringing her international profile, research and teaching expertise and leadership to the Faculty of Science. Professor Day is an active researcher who heads the Day Group at the Bio21 Molecular Science & Biotechnology Institute, where her team conducts research into malaria alongside several other leading malaria research groups. The Day Group particularly focuses on the role that human variation and parasite diversity play in modulating the dynamics of chronic infection, influencing susceptibility to disease, and regulating transmission from human to mosquito.



RESEARCH

Researchers, academics and PhD students from the Faculty of Science have contributed to some of the most significant and exciting research discoveries of recent times. From gravitational waves to green cities, our research is taking on the big problems and changing the world.



WE'RE PROVING EINSTEIN RIGHT

In one of the most significant physics discoveries ever, the existence of Albert Einstein's theorised gravitational waves was officially confirmed in 2016. These ripples in space-time will allow astronomers to explore the secrets of mysterious phenomena like black holes and neutron stars. Professor Andrew Melatos, from our School of Physics, is a member of LIGO, the international team that discovered gravitational waves. His team uses supercomputers and smart algorithms to search LIGO data for the tiny signals produced by neutron stars.



WE'RE SAVING OUR REEFS

The fragile coral that makes up our beautiful reefs has been under increasing threat in recent years as it struggles to adapt to climate change, leading to coral bleaching, reef decline and eventual coral death. Professor Madeleine van Oppen from our School of BioSciences is co-leading an international effort to save coral reefs by identifying and cultivating hardy coral species that can be transported to at-risk reefs, and manipulating the complex relationship between corals and microbes to accelerate coral evolution. Their efforts will assist the coral in adapting to warmer oceans and changing environmental conditions, preserving these precious reefs for generations to come.



WE'RE FIGHTING BACK AGAINST BUSHFIRES

During the 2015 bushfire season, a computer program dubbed PHOENIX RapidFire, developed by fire ecologist Associate Professor Kevin Tolhurst and programmer Derek Chong from our School of Ecosystem & Forest Sciences, played a crucial role in saving the township of Moyston in Victoria's west from a fast-moving grass fire. The program produces a graphical projection of how an uncontained fire is likely to spread, allowing firefighters to deploy their resources to the right places at the right times. PHOENIX RapidFire is now an invaluable tool used for fighting and studying fires right across Australia.



WE'RE PRINTING POWER

The next generation of solar power is being printed by organic chemist Dr Wallace Wong from our School of Chemistry and the Bio21 Molecular Science & Biotechnology Institute. Working with industry partners, Dr Wong and his team have developed flexible solar cells that are cheaper and more durable alternatives to the existing silicon-based solar panels. This portable, printable technology will eventually allow us to harness the power of the sun in our homes, our cars and maybe even our mobile phones and clothes.

INDUSTRY

The Faculty of Science is connected to a range of industry, business and government organisations. These connections influence our core curriculum and ensure that our students develop the relevant knowledge and skills to be ready for real world careers.



MELBOURNE ACCELERATOR PROGRAM

Faculty of Science students can turn ideas into reality through the Melbourne Accelerator Program (MAP), a business incubator that supports start-up companies with grants, office space and mentoring from industry leaders.

"I feel extremely honoured and privileged to be part of the MAP16 program. It won't just help our business, but will contribute immensely to my own personal growth and professional development. The program offers access to a huge global network of people; mentors, entrepreneurs, developers and teachers. My team and I will definitely be taking every opportunity that comes our way and leveraging the MAP contacts to learn as much as possible. Through this process we are hoping to achieve new heights with our business, to gain exposure, to learn with, grow with, and hopefully be successful with the nine other startups in the program."

Michelle Mannering, a Bachelor of Science graduate, was accepted into MAP16 as a member of Black, a team of hackers looking to change the world by creating a system that improves everyday life through analysis and insight.

INTERNSHIPS & INDUSTRY PROJECTS

You can engage with industry across public and private sectors by taking advantage of an internship placement or an industry project.

SCIE90017 Science & Technology Internship Subject

This subject will enable you to gain a real experience of a science or technology-related workplace while you study. You will explore the reality of careers in science and technology and start to think more about your own skills, personal development needs and potential career pathways. This subject is available to all students, pending appropriate approvals.

GEOG90022 International Internship in Environment

This internship subject is to be completed with an organisation located outside of Australia, and provides students with an invaluable practical experience and a chance to build your international industry networks and enhance your knowledge and skills in your chosen area of study. This is an elective subject available to students in the Master of Environment, Master of Urban Horticulture, Master of Forest Ecosystem Science and Master of Geography.

HORT90049 Master of Urban Horticulture Internship

Undertaking this subject provides students with an exciting opportunity to gain direct exposure to vocational experience and professional practice in your chosen field. This subject combines academic learning, employability skills and attributes, and the development of specific skills and knowledge through a placement with an organisation relevant to the urban horticultural industry. This subject is available to students in the Master of Urban Horticulture.

FRST90035 Forest Internship Project

The subject aims to provide high-level employment experience with government, industry or non-governmental organisations. Undertaking this subject will develop your knowledge of employer expectations of forest science graduates in the work environment, and the skills required to perform with excellence in the workplace. This subject is available to students in the Master of Forest Ecosystem Science.

SCIE90015 Industry Project in Biotechnology

As a core subject within the Master of Biotechnology, this subject provides practical insights into the role of science and scientific thinking within business, and the successful application of this perspective, along with communication and business tools, to work environments. You will be assigned to syndicate groups to address a practical challenge or issue that has been identified by an industry partner. This subject is available to students in the Master of Biotechnology.

For more information about these subjects, visit: science.unimelb.edu.au/students/enrich-your-studies.

OUR COMMUNITY

The Faculty of Science includes seven schools, the Office for Environmental Programs and the Bio21 Molecular Science & Biotechnology Institute. We also have close links with many research and training facilities.

CAMPUSES

Parkville

Parkville is the central University of Melbourne campus, located just north of the city centre, and is home to over 40,000 students. This beautiful campus dates from the mid-nineteenth century, with many historic buildings and gardens. The seven schools in the Faculty of Science all have a presence at the Parkville campus.

Burnley

The Burnley campus in Melbourne's inner east is a dynamic, multidisciplinary research centre with a focus on green infrastructure, urban ecology, ecohydrology and forest science. Set amongst nine hectares of heritage-listed gardens and showcasing a range of green infrastructure, including the renowned Burnley Green Roof, the campus celebrated 125 years as a home of horticultural education in 2016.

Creswick campus

Approximately 120 kilometres from Melbourne is our Creswick campus, situated on 20 hectares of land with adjacent native and plantation forests. Creswick has been an important location for forest science education since 1910, and the historic campus contains significant heritage goldfields architecture. The Creswick campus is the only dedicated forest ecosystem science campus in Australia.

SOCIAL LIFE

Students can take part in a range of social activities both on and off-campus, with a huge range of opportunities available. From trips to the University's lodge on Mount Buller with the Ski Club or taking the boat out with the Waterski and Wakeboard team, to volunteering for the University chapter of a global non-profit or joining one of Victoria's leading choirs, the Melbourne University Choral Society, there is something for every skillset and interest.

University of Melbourne Student Union (UMSU)

UMSU has a history that extends over 150 years and is committed to creating quality on-campus experiences for students. Students automatically have access to all Student Union services.

UMSU International

UMSU International is the official representative body for international students, provided by the Student Union. International students automatically have access to all UMSU International services.

Melbourne University Sport

Melbourne University Sport provides students with a gym, pool, courts and grounds. They also facilitate sporting teams and competitions. All students can access services casually, or join at discounted rates.

Graduate Student Association (GSA)

GSA provides a 24-hour study space, lockers and offices for graduate students, as well as a printing and publishing centre, computer labs, and a graduate bar and café. Graduate students automatically have access to all GSA services.

EVENTS & OPPORTUNITIES

The Faculty of Science and the wider University host many events throughout the year, including public lectures featuring renowned local and international researchers, as well as industry and career events and various social activities. Many events are free for students. These events, and many others, are communicated to students in the monthly GradSci News e-newsletter, which also includes job alerts, science in the media and opportunities for students.

Science Career Conversations

Science Career Conversations is a series of networking events that highlight the broad range of career opportunities available to students in the Faculty of Science. At each event, students hear stories, ideas and insights from a specially selected panel of industry professionals and alumni. Previous guests include representatives from the Bureau of Meteorology, IBM, World Wildlife Foundation and Deloitte. The events include a large panel discussion and smaller break-away workshops where students have the opportunity to meet, ask questions and continue discussions with chosen panellists.

Science Festival

Science Festival is an annual event hosted by the Faculty of Science during National Science Week. Science Festival features guest speakers, science displays, workshops, activities, and much more. Keynote speakers in previous years have included renowned science communicator Margaret Wertheim, and environmental author and academic Tim Flannery.

Science Student Ambassadors

Science Student Ambassadors are student representatives for the Faculty of Science, selected specifically to assist with promoting our programs, participating in events such as Science Career Conversations, Orientation and Next Steps, and contributing to our social media presence. Ambassadors are provided with leadership training and are supported throughout the program. It is a great opportunity to develop networking, leadership and communications skills, and to enhance your degree. Ambassadors are also regularly featured in Faculty of Science marketing materials and online.

We encourage all enthusiastic and motivated Science students to apply. To find out more, visit: science.unimelb.edu.au/students/enrich-your-studies.

SUPPORT

In addition to assistance with administrative processes and course enquiries, graduate students in the Faculty of Science have access to computer labs, meeting rooms and a student lounge. Other student services include:

- Tutorials and ESL workshops run by the Academic Skills Unit
- Internship and employment advice from the Melbourne Careers Centre
- Childcare provided by Children's Services
- Free counselling provided by Counselling and Psychological Services
- Individualised assistance from Student Equity and Disability Support
- Financial assistance from Student Financial Aid
- Bulk-billed medical appointments through Health Services
- Tenancy advice from Student Housing Services
- Faith-based services provided by Chaplaincy

For a complete list of student services, visit: services.unimelb.edu.au.

BACHELOR OF SCIENCE AT MELBOURNE

Start your studies in science at Melbourne by completing a Bachelor of Science, choosing from one of our 41⁸ majors.

ENTRY REQUIREMENTS

Qualification	Bachelor of Science	Bachelor of Science (Extended) ⁸	Science (Chancellor's Scholars Program)	Diploma in General Studies
Australian Year 12				
Domestic students: 2017 Minimum ATAR ¹	85.00	50.00	99.90 ²	50.00
Domestic students: 2016 Clearly-in Rank	85.00	NA	99.90	NA
International students: 2017 Guaranteed ATAR ³	85.00	NA	99.90 ²	NA
VCE (units 3 and 4) prerequisite subjects	A study score of at least 25 in English/English Language/Literature or at least 30 in EAL, and at least 25 in Mathematical Methods (CAS) or Specialist Mathematics, and in one of Biology, Chemistry or Physics; OR a study score of at least 25 in English/English Language/Literature or at least 30 in EAL, and at least 25 in both Mathematical Methods (CAS) and Specialist Mathematics ⁴	Prerequisite subjects apply ⁵	As per the Bachelor of Science (see left)	A study score of at least 25 in English/English Language/Literature or at least 30 in EAL ⁵
International Baccalaureate (IB) Diploma				
International students: 2017 Guaranteed IB score ³	31	Prerequisite subjects apply ⁵	99.90 (notional ATAR) ²	NA
IB prerequisite subjects ⁷	English, Mathematics (or Further Mathematics), and one of Biology, Chemistry or Physics, OR English, Mathematics and Further Mathematics ⁴	NA	As per the Bachelor of Science (see left)	English
GCE A Levels/Singapore A Levels				
International students: 2017 Guaranteed score ³	BCC	NA	Not available to A Levels students	Not available to A Levels Students
A Level prerequisite subjects ⁴	Mathematics and one of Biology, Chemistry or Physics and at least Grade C in an accepted AS Level English subject ⁴	NA		
Trinity College Foundation Studies				
2017 Guaranteed score	80	NA	Not available to TCFS Students	Not available to TCFS Students
TCFS prerequisite subjects	EAP (a score of at least 50%), English, Mathematics 1, and one of Biology, Chemistry or Physics OR EAP (a score of at least 50%), English and both Mathematics 1 and Mathematics 2 ⁶	NA		

- ¹ Domestic students: Applicants who achieve the minimum ATAR for a course will be eligible for a place, provided prerequisite studies and any other specific course requirements are met. The Clearly-in Rank may be higher, depending on demand for the course and the number of places available. Only applicants eligible for special entry schemes will be admitted below the minimum ATAR.
- ² Students who achieve an ATAR or notional ATAR of 99.90 or above and satisfy course prerequisites will be guaranteed a place in the Chancellor's Scholars Program. Students must have completed an Australian Year 12 qualification or the International Baccalaureate (IB) in Australia in the year prior to entry (students must either enrol immediately or be granted a deferral in the year following Year 12).
- ³ International students: The University guarantees admission to a course when an international student achieves the required score, meets prerequisite studies, satisfies the English language requirements and there are still places available in the course at the time of acceptance. If you do not meet the guaranteed score your application will not be considered for entry. Guaranteed scores apply only if no further study has been undertaken after completion of one of these programs.
Domestic students completing an international qualification: The score listed should be considered a minimum score to be eligible for a place in that course. The actual standard required may be higher depending on the demand for the course and the number of Commonwealth Supported Places (CSPs) available.
- ⁴ Accepted GCE AS and A Level English subjects are: General Paper, General Studies, English Language and Literature, English Literature, English Language. Singapore A Level subject Knowledge and Enquiry (H2) is also accepted.
- ⁵ The 2017 study scores for the Diploma in General Studies are subject to review. For current details see: coursesearch.unimelb.edu.au
- ⁶ Applicants intending to progress to the Doctor of Veterinary Medicine are encouraged to complete VCE Units 3 and 4 in Chemistry or equivalent.
- ⁷ For students with English as their second language a pass in English B at the required level will be accepted as satisfying the English prerequisite. Except where specified, IB subjects must be passed to at least Grade 4 Standard or Higher Level. Mathematical Studies is not deemed equivalent to VCE Mathematical Methods.
- ⁸ To be eligible for the Bachelor of Science (Extended), you must be of Aboriginal or Torres Strait Islander descent.
- ⁹ Satisfactory completion of one of biology, chemistry, physics or mathematics to at least Year 11 level, and English at Year 12 level. Demonstrated ability to succeed in science study. Non-school leavers, mature-age students and alternative pathway applications will be considered. All eligible applicants will be required to attend an interview.

PLANNING YOUR BACHELOR OF SCIENCE

During the three years of your Bachelor of Science degree, you can study subjects from across the scientific disciplines before beginning to specialise in an area of your choice. In most cases, you can keep a range of major options open until the end of your second year. Your major will provide a coherent study experience and a depth of knowledge in a single science or technology discipline, or in an interdisciplinary area.

Your choice of major will inform your graduate study options, with many majors leading into our graduate sciences degrees. You can see the undergraduate major disciplines that are appropriate for entry into each graduate degree on the corresponding pages in this guide.

Majors available in the Bachelor of Science in 2017:

Agricultural Science	Climate & Weather	Genetics	Microbiology & Immunology
Animal Health & Disease	Computational Biology	Geography	Neuroscience
Animal Science & Management	Computing & Software Systems	Geology	Pathology
Biochemistry & Molecular Biology	Data Science	Human Structure & Function	Pharmacology
Bioengineering Systems	Ecology & Evolutionary Biology	Immunology	Physics
Biotechnology	Electrical Systems	Informatics	Physiology
Cell & Developmental Biology	Environmental Engineering Systems	Marine Biology	Plant Science
Chemical Systems	Environmental Science	Mathematical Physics	Psychology
Chemistry	Food Science	Mathematics & Statistics	Spatial Systems
Civil Systems	Forest Science	Mechanical Systems	Zoology
		Mechatronics Systems	



“I had a wonderful time at Melbourne University as an undergraduate student. The subjects I took were extremely stimulating and fun and I really enjoyed the friendly and vibrant environment offered here. Therefore it was natural for me to take a level up and study more advanced topics in my masters degree.”

Eric Shen, Master of Science (Mathematics & Statistics)

Graduate of the Bachelor of Science with a major in Mathematics & Statistics

MASTERS DEGREES IN THE FACULTY OF SCIENCE

The primary options for students wishing to complete a masters degree through the Faculty of Science are the Master of Science, a research training program with 10 different streams, and our eight Professional Masters by Coursework options.

AVAILABLE COURSES

The Faculty of Science offers several options for students wishing to complete a masters degree:

- The Master of Science, in all streams, gives students the opportunity to undertake advanced research training as well as specialised coursework studies and professional skills development. These courses serve as a strong foundation for further graduate research, including a PhD.
- The Professional Masters by Coursework degrees are designed for those seeking a career in industry, with specialised coursework subjects and professional skills development.
- If you have already completed an honours year, you may also be eligible for the research-based Master of Philosophy through the Faculty of Science; for more information about this course and our graduate research options, see page 30.

APPLICATIONS

Entry requirements

Entry requirements for all masters degrees offered through the Faculty of Science are outlined on the corresponding pages in this guide.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

Submitting an application

Domestic students are required to submit applications online. Applications for domestic students close 30 November for Semester 1 entry and 31 May for Semester 2 entry. Applications may be accepted after these dates, depending on availability.

International students can submit applications online or via a University of Melbourne overseas representative. Applications for international students close 31 October for Semester 1 entry and 30 April for Semester 2 entry. Applications may be accepted after these dates, depending on availability.

For more information, and to submit your application, visit: futurestudents.unimelb.edu.au/admissions/applications/online-application-info.

FINANCING YOUR DEGREE

There are several different fee options available to students applying for graduate study at the University of Melbourne. Not all options are offered for all courses, and this is outlined in the table on page 9.

Your course fee per year is calculated on the basis of one year full-time study (1 EFTSL). One year at the University of Melbourne equates to 100 points. Fees are charged as you enrol into subjects, and in most degrees will be based on the subject point value as a fraction of EFTSL x the annual course fee. The Master of Environment is an exception to this, and in this program fees will vary depending on the subjects that you are taking. The University of Melbourne reviews fees annually. For additional fee information, visit: futurestudents.unimelb.edu.au/admissions/fees.

Domestic students

Commonwealth Supported Place (CSP)

A CSP is subsidised by the Australian Government and, based on the subjects undertaken, you will pay a determined contribution amount. You may also be eligible for HECS-HELP to assist with these payments; if you are eligible, you can defer all or part of this student contribution amount via a government loan, which you repay when your income reaches the minimum repayment threshold. For more information, visit: studypassist.gov.au.

Australian Fee (AF) Place

Under this fee option, you will be required to pay the full cost of your tuition fees. You may be eligible for FEE-HELP to assist with these payments; if you are eligible, you can defer all or part of your tuition fees via a government loan, which you repay when your income reaches the minimum repayment threshold. You can also nominate to make voluntary repayments of your FEE-HELP loan at any time. For more information, visit: studypassist.gov.au.

International students

Overseas Fee (OF) Place

Under this fee option, you will be required to pay the full cost of your tuition fees. For more information about fees, visit: futurestudents.unimelb.edu.au/admissions/fees.

Scholarships & Awards

The University of Melbourne and Faculty of Science have a range of scholarships, awards and other funding opportunities available to graduate students, both domestic and international.

Scholarships may be based on merit, or needs and circumstances, and range from one-off payments to annual stipends, full tuition waivers and funding for specific activities/items, such as relocation, residential costs or overseas study. For a full list of scholarships and further information, visit: science.unimelb.edu.au/students/scholarships.

International Postgraduate Coursework Awards (IPCAs)

International Postgraduate Coursework Awards (IPCAs) are awarded to high achieving international students undertaking a graduate coursework degree. Fee remissions of between 50% and 100% are offered and international students will be automatically considered for an IPCA as part of the application process.

Graduate Access Melbourne (Domestic students only)

The University of Melbourne is committed to providing education opportunities for students from a range of backgrounds. Graduate Access Melbourne is the University's special entry and access scheme for graduate study. By submitting a Graduate Access Melbourne application, you can be assured that any circumstances that have affected your tertiary study will be considered when we assess your application.

Graduate Access Melbourne could help you secure a place in the course of your choice, gain access to a CSP, or receive a scholarship or bursary. For more information, visit: futurestudents.unimelb.edu.au/admissions/access_melbourne_and_equity_programs/graduate-access-melbourne.

AVAILABILITY & ELIGIBILITY

	Domestic Students		International Students
	CSP	AF Place	IPCA
MASTER OF SCIENCE			
Master of Science (Bioinformatics) See page 10 for more information	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	N/A
Master of Science (BioSciences) See page 11 for more information ^s	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Chemistry) See page 12 for more information	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Computer Science) See page 13 for more information	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	N/A
Master of Science (Earth Sciences) See page 14 for more information ^s	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Ecosystem Science) See page 15 for more information ^s	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Epidemiology) See page 16 for more information	N/A	Automatic consideration for all students eligible for entry	N/A
Master of Science (Mathematics & Statistics) See page 17 for more information	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Physics) See page 18 for more information ^s	Available to students with at least a 70% Weighted Average Mark in the best 50 points of appropriate discipline studies in your final year	Automatic consideration for all students eligible for entry	A limited number of IPCAs (100% and 50%) are available for high achieving students
Master of Science (Vision Science) See page 19 for more information ^s	N/A	Automatic consideration for all students eligible for entry	N/A
PROFESSIONAL MASTERS BY COURSEWORK			
Master of Biotechnology See page 21 for more information	Limited availability for top students	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students
Master of Data Science See page 22 for more information	Available to students with at least a 75% Weighted Average Mark	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students
Master of Environment See page 23 for more information	Limited availability for top students	Automatic consideration for all students eligible for entry	N/A
Master of Environmental Science See page 24 for more information	Available to students with at least a 75% Weighted Average Mark	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students
Master of Forest Ecosystem Science See page 25 for more information	Available to students with at least a 75% Weighted Average Mark	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students
Master of Geography See page 26 for more information	Available to students with at least a 75% Weighted Average Mark	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students
Master of Geoscience See page 27 for more information	Available to students with at least a 75% Weighted Average Mark ¹	Automatic consideration for all students eligible for entry ¹	A limited number of IPCAs (50%) are available for high achieving students
Master of Urban Horticulture See page 28 for more information	Available to students with at least a 75% Weighted Average Mark	Automatic consideration for all students eligible for entry	A limited number of IPCAs (50%) are available for high achieving students

^s Indicates that a supervisor is required. Please refer to the relevant course entry for more information.

¹ From Semester 1, 2017

MASTER OF SCIENCE (BIOINFORMATICS)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and may be available at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: biology, biomedicine, mathematics, statistics and computer science.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level and must have also completed MAST10005 Calculus 1 (or equivalent).

develop your own research, and use bioinformatics tools to analysis scientific data.

EMPLOYABILITY

Employers in this field range from medical research institutes, state government departments of health, agriculture, environment and economic development, federal departments of defence, environment, innovation and health, public health research laboratories, research hospitals, research-focused companies such as IBM and CSL, and academic institutions and related research infrastructure initiatives such as VLSCI, Nectar and RDS.

Many of our Master of Science (Bioinformatics) students go on to work as data scientists in high profile research groups and some then progress to a PhD. All participate in a range of activities supported by organisations such as VLSCI, EMBL-ABR, COMBINE and ABACBS, which have been established to promote, resource and offer networks and skills to help nurture careers for people wanting to work in this sector.

OVERVIEW

Bioinformatics is the future of biological research. This multidisciplinary field combines all areas of biology, including genetics, molecular biology, biochemistry and physiology, with computer science, statistics and applied mathematics. Bioinformaticians act as an effective bridge between biologists and computer scientists, enhancing understanding of biology and biological processes.

As a student in the Master of Science (Bioinformatics), you will learn from high profile researchers and practitioners working in the heart of the internationally renowned Parkville Biomedical Precinct, one of the

most highly concentrated biological research and health services precincts in the world. You'll develop a broad knowledge of bioinformatics, with strong foundations in computer science, and undertake independent research in a specialised stream of bioinformatics.

RESEARCH PROJECT

The Bioinformatics Research Project is worth 50 credit points, and involves the development and application of the tools of bioinformatics to address a significant research problem. You will be provided with a list of potential research projects upon commencement of your degree. You will be required to critically appraise relevant scientific literature, plan and

Sample course plan - Biology/Biomedicine stream

Year 1	Semester 1	Elements of Bioinformatics	Elements of Probability	Programming & Software Development	Elective
	Semester 2	Elements of Statistics	Algorithms & Complexity	Elective	Research Project Part 1
Year 2	Semester 1	Statistics for Bioinformatics	Communication for Research Scientists	Genomics & Bioinformatics	Research Project Part 2
	Semester 2	Bioinformatics Case Studies	Algorithms for Functional Genomics	Research Project Part 3	

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

"The last 15 years has seen a massive increase in the amount of biological data we are able to produce. Bioinformatics is about using techniques from computer science and statistics to extract information from this data.

The Master of Science (Bioinformatics) is a unique course in Australia, taking students from computer science, biology and statistics backgrounds. By taking subjects in other areas you develop a wide range of skills, applicable to many potential occupations. Being part of the Parkville Biomedical Precinct is also a big plus, with the University having close connections to the nearby research institutes."

Luke Zappia, PhD student
Bachelor of Science, Diploma in Informatics,
Master of Science (Bioinformatics)



MASTER OF SCIENCE (BIOSCIENCES)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: biomedicine, computational biology, ecology, evolutionary biology, environmental science, genetics, physiology, plant science, animal science and zoology.

Applications must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

OVERVIEW

The Master of Science (BioSciences) covers all of the biological sciences, including botany, genetics and zoology. Students specialise in one area of interest. You will have flexibility in building a degree to suit you, and develop complimentary skills in communications, business and science application. The School of BioSciences is the largest within the Faculty of Science, and world-renowned academics and researchers support teaching across three discipline areas: ecology, evolution and environmental science; genetics, genomics and development; and plant science.

RESEARCH PROJECT

The BioSciences Research Project comprises most of the degree, (125 of the 200 credit points), and involves laboratory or field-based experimental research in your chosen discipline area. You will develop a range of experimental and technical skills, as well as goal-setting and the capacity to design and plan experiments. Students are required to find and contact a supervisor prior to applying for this degree, and you will be based in the laboratory of an academic staff member in the School of BioSciences (or an approved external supervisor). To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

EMPLOYABILITY

Many of our Master of Science (BioSciences) graduates work in government departments at both a state and federal level, and with environmental protection or management agencies. Others have commenced or completed a PhD. Jobs held by some of our graduates include:

- Research technician with the Centre for Aquatic Pollution Identification & Management
- Environmental officer with the Northern Territory Environment Protection Authority
- Marine scientist with the Australian Marine Oil Spill Centre
- Founder of a scientific magazine
- Project officer with the Federal Department of Environment
- Taxonomical classification with Museum Victoria
- Employee at an oyster aquaculture hatchery
- Review officer with the Climate Change Authority

Sample course plan

Year 1	Semester 1	Current Topics in Developmental Genetics	Biometry	Elective	Research Project Part 1
	Semester 2	Elective	Elective		Research Project Part 2
Year 2	Semester 1	Communication for Research Scientists	Research Project Part 3		
	Semester 2	Research Project Part 4			

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

"I am studying botany to better understand the nature and composition of airborne pollen and how it affects Melbournians affected by hay fever.

The beauty of the Master of Science (BioSciences) is that you are able to choose a project that interests you, which can incorporate aspects from botany, zoology and genetics. It also fosters a collegial academic environment in which you can share your research with others interested in your field."

Lachlan Tegart,
Master of Science (BioSciences)
Bachelor of Biomedicine



MASTER OF SCIENCE (CHEMISTRY)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: chemistry (or equivalent).

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level and must also have completed at least 25 points (two subjects or equivalent) of final-year university-level chemistry, of which 12.5 points (one subject or equivalent) must be practical-based subjects.

OVERVIEW

Chemistry is an essential component in how we understand and progress almost every sphere of science, and staff at the University of Melbourne are world leaders in areas such as molecular analysis, drug discovery, materials science, sustainable energy and nanotechnology. The Master of Science (Chemistry) pairs high levels of specialised teaching and learning together with professional skills training options to equip students with both scientific and business acumen. Students in this degree will become part of one of the largest and oldest schools of chemistry in Australia,

contributing to and further building on the interdisciplinary links within the University and with local and international research institutes.

RESEARCH PROJECT

The Chemistry Research Project comprises most of the degree (125 of the 200 credit points), and involves undertaking experimental and/or theoretical research in an area of current relevance to one of our research groups. Through this project you will develop the process and practice of chemical research, along with your investigative skills, critical thought, and ability to evaluate information and analyse

experimental data. You will also increase your fundamental knowledge and understanding of chemical science. You are not required to confirm a supervisor prior to application, but we encourage you to make contact with potential supervisors in the School of Chemistry.

EMPLOYABILITY

Chemistry is applicable in many fields of research and industry. Our graduates go on to careers in:

- Commercial and government laboratories
- Environmental monitoring and remediation
- Renewable energy
- Patent law
- Education
- Pharmaceutical companies
- Food manufacturing and science
- Investment analysis
- Nanomaterials
- Scientific industries sales and services
- Policy development

Sample course plan

Year 1	Semester 1	Advanced Spectroscopy	Chemical Synthesis & Characterisation 1	Research Project Part 1
	Semester 2	Advanced Chemical Applications 1	Science & Technology Internship Subject	Research Project Part 2
Year 2	Semester 1	Systems Modelling & Simulation	Research Project Part 3	
	Semester 2	Advanced Chemical Applications 2	Research Project Part 4	

■ Discipline Core ■ Professional Skills Subject ■ Research Project ■ Elective



“Studying at the University has not only exposed me to interesting research opportunities, but has greatly facilitated networking amongst academic and industrial contacts as well.

The main highlight of my studies has been publishing a detailed review paper finally explaining a reaction that has been widely used yet misunderstood for over 100 years! I’ve also developed an automatic phosphate monitoring system that can run for weeks to months at a time using alcohol and UV light.”

**Edward Nagul, PhD student
Bachelor of Science,
Master of Science (Chemistry)**

MASTER OF SCIENCE (COMPUTER SCIENCE)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: computer science (or equivalent).

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level and must also have completed at least 25 points (two subjects or equivalent) of university-level mathematics or statistics subjects. Some knowledge of formal logic and discrete mathematics, and second-year level mathematics/statistics is also recommended.

of academic staff members from the Department of Computing & Information Systems. You will receive information about the range of research projects available upon commencement of your degree, and will then complete your selection of a project and supervisor.

EMPLOYABILITY

Computer science is now an integral part of our society, and some of our graduates go on to jobs in a range of industries, while others complete further computer science research through a PhD. Graduates can pursue careers in:

- Applications programming
- Information architecture
- Systems and network analysis
- Software designing and engineering
- Computational research
- Big Data architecture/engineering
- Analyst programming

OVERVIEW

Technology is continually changing the way we live our lives, particularly in fields such as health sciences and social infrastructure. The Master of Science (Computer Science) covers the breadth of this technology while allowing students to specialise in an area such as distributed and parallel computing, declarative languages, or knowledge technology. You will be part of the most

exciting technology hub in the country, home to the Victorian Life Science Computation Initiative (VLSCI) and our associated research collaboration with IBM.

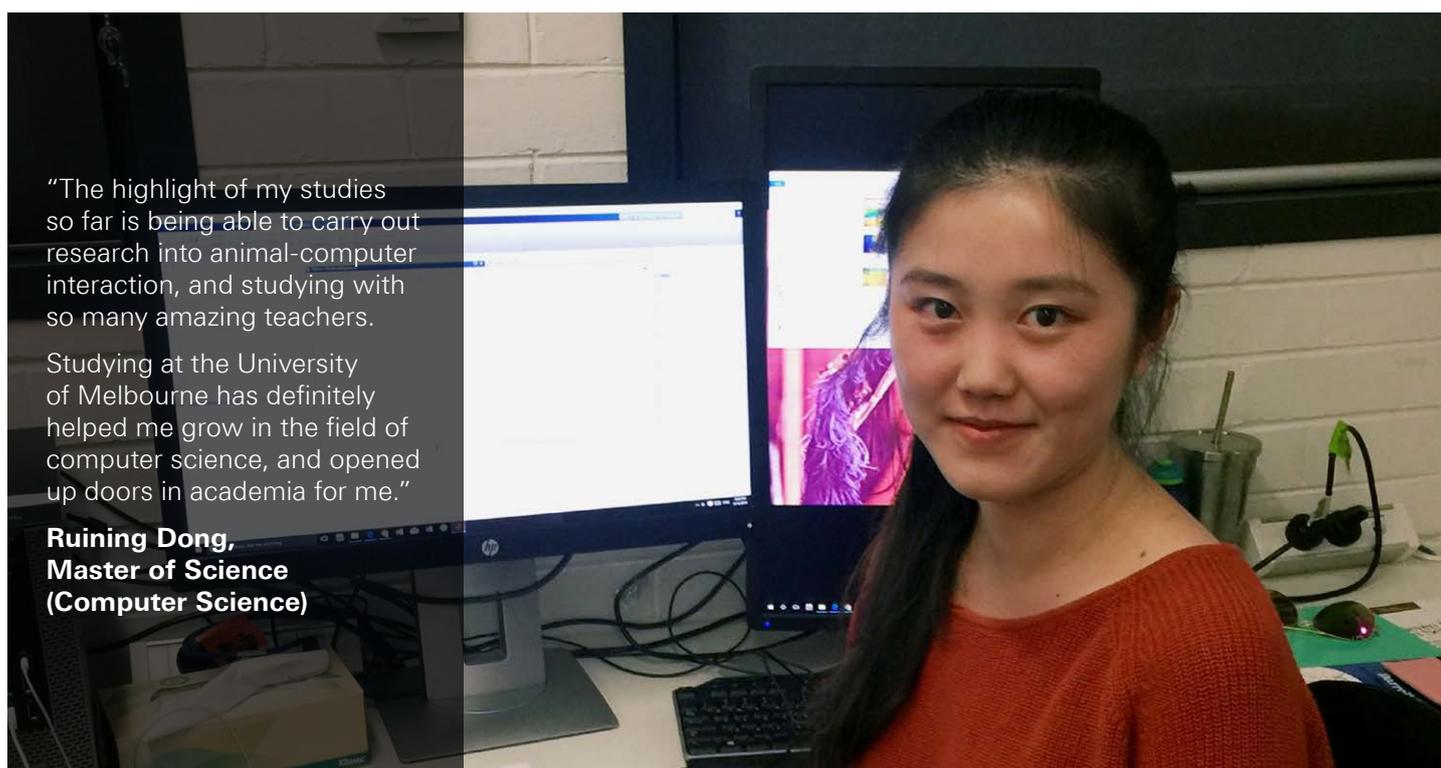
RESEARCH PROJECT

The Computer Science Research Project is worth 75 credit points, and involves the completion of a research investigation under the supervision

Sample course plan

Year 1	Semester 1	Knowledge Technologies	Distributed Systems	Elective	Thinking & Reasoning with Data
	Semester 2	Declarative Programming	Research Methods	Elective	Elective
Year 2	Semester 1	Elective	Elective	Research Project Part 1	
	Semester 2	Elective	Research Project Part 2		

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective



"The highlight of my studies so far is being able to carry out research into animal-computer interaction, and studying with so many amazing teachers.

Studying at the University of Melbourne has definitely helped me grow in the field of computer science, and opened up doors in academia for me."

**Ruining Dong,
Master of Science
(Computer Science)**

MASTER OF SCIENCE (EARTH SCIENCES)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: agricultural science, climate and weather, biochemistry, botany, chemistry, engineering, environmental science, food science, genetics, geography, geology, mathematics, microbiology, physics, plant science and zoology.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

EMPLOYABILITY

The Master of Science (Earth Sciences) can lead to a wide variety of careers, including:

- Climatologist
- Energy specialist
- Environmental consultant
- Environmental geologist
- Exploration geologist
- Mine geologist
- Researcher
- Resources geologist
- State geological surveyor
- Weather forecaster

Our graduates are employed by mining companies, environmental consultancy companies, state and federal government departments, and research organisations.

OVERVIEW

The Master of Science (Earth Sciences) brings together research and researchers exploring the solid Earth, the fluid Earth and the processes that operate at the interface of these regions. Students choose from either an atmospheric science or a geology stream and will benefit from existing research activities across these disciplines, with focuses including climate variability and change, sedimentary geology, palaeontology, and the physics and chemistry of Earth's deep interior. This degree also incorporates collaborations with partner universities under the Victorian Institute

of Earth and Planetary Sciences, affording you access to the best and broadest array of advanced coursework in the discipline.

RESEARCH PROJECT

The Earth Sciences Research Project comprises most of the degree (125 of the 200 credit points) and requires the completion of original research in your main field of interest, resulting in a paper of publishable standard that you will be encouraged to submit to a scientific journal. Students are required to find and contact a supervisor prior to applying for this degree.

Sample course plan

Year 1	Semester 1	Ore Reserve Estimation	Australian Coal Basins	Introduction to Mineralogy	Ore Textures & Breccias (June)	Research Project Part 1
	Semester 2	Environmental Geology Field Techniques	Fundamentals of Geological CO2 Storage	Science Communication		Research Project Part 2
Year 2	Semester 1	Ore Deposit Models	Practical Igneous Petrology	Research Project Part 3		
	Semester 2	Earth's Biogeochemical Cycles		Research Project Part 4		

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

"I love exploring the natural world and I have always been curious about how things come about. Studying geology has allowed me to learn so many things about the Earth and its history. I have been lucky enough to travel to different places around the world and see some of the finest spectacles Earth has to offer. The highlight of my studies was travelling to Timor-Leste for my Masters research. I spent six weeks in very remote areas of the island in order to map the geology and collect samples for further analysis."

Jeremy Lee,
Master of Science (Earth Sciences)
Bachelor of Science



MASTER OF SCIENCE (ECOSYSTEM SCIENCE)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: agricultural science, botany, ecology, environmental science, environmental management, environmental studies, environmental engineering, environmental economics, forest science, genetics, geography, geology, hydrology, environmental psychology, soil science and zoology.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

new knowledge within these scientific paradigms. Students are required to find and contact a supervisor prior to applying for this degree. To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

EMPLOYABILITY

The Master of Science (Ecosystem Science) can lead to a wide variety of careers such as:

- Landscape manager
- Conservation manager
- Environmental consultant
- Sustainability officer (local government)
- Biodiversity officer (local government)
- Environmental policy officer (state or federal government)

Graduates of this degree will also be well equipped to pursue a higher degree by research, such as a PhD.

OVERVIEW

As a student in the Master of Science (Ecosystem Science), you will be able to develop your own research interests in one of our supported and resourced discipline areas, including: conservation biology, ecology, ecophysiology, environmental psychology, environmental and landscape management, forest science, genetics, horticulture, hydrology, and soil science. Through this degree, you will build complementary skills in science communication, data analysis and modelling, ethics and leadership, and become part of a research community

spread across three different and dynamic campuses located in Parkville, Burnley and Creswick.

RESEARCH PROJECT

The Ecosystem Science Research Project comprises most of the degree (125 of the 200 credit points), with students required to design and conduct independent research in one or more disciplines within the field of ecosystem science, depending on the availability of appropriate expertise. You will develop skills in critically evaluating

Sample course plan

Year 1	Semester 1	Research Methods for Life Sciences	Environmental Impact Assessment	Research Project Part 1
	Semester 2	Graduate Seminar: Environmental Science	Forests, Carbon & Climate Change	Research Project Part 2
Year 2	Semester 1	Environmental Modelling	Ethics & Responsibility in Science	Research Project Part 3
	Semester 2	Research Project Part 4		

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective



“The University of Melbourne provides a huge variety of choice, great resources and supportive staff. I never would have envisioned studying fire until I completed a geography elective subject in my undergraduate degree which had a focus on fire ecology. The breadth of choice at the University opens up so many opportunities that I would not have considered. I am now researching how flammability changes with time since fire in a range of ecosystems.”

Sarah McColl-Gausden,
Master of Science (Ecosystem Science)
Bachelor of Science

MASTER OF SCIENCE (EPIDEMIOLOGY)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February).

Undergraduate majors in the following disciplines are appropriate for entry into this course: any science discipline.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

students with the opportunity to plan and execute several different research-based projects under supervision. Depending on the availability of appropriate expertise, you may address a broad range of epidemiological issues in these projects. Students are not required to find a supervisor prior to applying for this degree.

OVERVIEW

Epidemiologists are the medical detectives of population health, solving puzzles about who gets diseases, what causes these diseases, and how they can be prevented. In the Master of Science (Epidemiology), you will study the basic science of public health, with applications that extend to clinical research and practice. You will work extensively with numbers, and develop your critical

thinking and reasoning skills. This degree is taught by the Melbourne School of Population & Global Health through the Faculty of Medicine, Dentistry & Health Sciences, offering students unique access to a huge range of resources and research areas.

RESEARCH PROJECT

The Epidemiology Research Project is worth 50 credit points, and provides

EMPLOYABILITY

Epidemiologists are in high demand, and our graduates go on to careers in:

- Medical research institutes
- Pharmaceutical companies
- Biotechnology companies
- Hospitals
- Non-profit organisations
- Government

Sample course plan

Year 1	Semester 1	Epidemiology 1	Biostatistics	Epidemiology of Epidemics	Infectious Disease Epidemiology
	Semester 2	Epidemiology 2	Linear & Logistic Regression	Survival Analysis & Regression for Rates	Epidemiology 2
Year 2	Semester 1	Epidemiology 3	Systems Modelling & Simulation	Research Project Part 1	
	Semester 2	Genetics Epidemiology	Science Communication	Research Project Part 2	

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective



“I love how wide ranging epidemiology can be. You can live anywhere and study almost anything to do with health. It is an opportunity to make real change in health and in healthcare for many people around the world. My research project is a data analysis looking into the transfer of malarial antibodies from mother to infant during pregnancy, and what factors influence the antibody levels in newborns.”

Julia Maguire, Master of Science (Epidemiology) Bachelor of Science

MASTER OF SCIENCE (MATHEMATICS & STATISTICS)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: mathematics, statistics and mathematical physics.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

be allowed to complete two 25 point research projects in lieu of a single 50 point project.

EMPLOYABILITY

Mathematics and statistics are applicable across numerous areas of business, and these are sought-after skills generally. Qualified mathematicians and statisticians are in high demand, and often attract head-hunters and above-average salaries. Our graduates go on to careers in:

- Quantitative and equities analysis
- Operations research
- Consulting
- Data services
- Strategic management
- Financial services and fund management
- Statistics and biostatistics
- Business development
- Scientific programming

OVERVIEW

Mathematics has been a source of human fascination since ancient times, and is still integral across all fields of scientific investigation. The Master of Science (Mathematics & Statistics) offers students flexibility to study subjects in the areas of pure mathematics, applied mathematics and mathematical physics, discrete mathematics and operations research, and statistics and stochastic processes. You will also specialise in the area of your choice, studying and learning at an advanced level and building an ideal base for undertaking further research in the field. You will benefit from the

knowledge of renowned academic and research staff, and our affiliations with the Statistical Consulting Centre and the newly-launched MATRIX research station.

RESEARCH PROJECT

The Mathematics & Statistics Research Project is worth 50 credit points, conducted in a relevant research area under academic supervision. Students are not required to find a supervisor prior to applying for this degree, but you must nominate your preferred specialisation and expected area of research focus as part of the application process. Under special circumstances, students may

Sample course plan - Pure Mathematics Specialisation

Year 1	Semester 1	Measure Theory	Differential Topology & Geometry	Stochastic Calculus with Applications	Adv. Methods: Differential Equations
	Semester 2	Representation Theory	Riemann Surfaces & Complex Analysis	Continuum Mechanics	Research Project Part 1
Year 2	Semester 1	Algebraic Topology	Commutative & Multilinear Algebra	Systems Modelling & Simulation	Research Project Part 2
	Semester 2	Introduction to String Theory	Groups, Categories & Homological Algebra	Research Project Part 3	

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

“I simply love solving complicated problems. When you have been thinking about a problem for a long time and finally get the answer, you get such a great sense of fulfilment! I chose the Applied Mathematics Specialisation within the Master of Science (Mathematics & Statistics) because this gives me the opportunity to look at processes in the real-world, like natural sciences, finance and engineering, and analyse or model their behaviour.”

**Lotte Romijn,
Master of Science
(Mathematics & Statistics)**



MASTER OF SCIENCE (PHYSICS)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and may be available at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: physics, mathematical physics, chemical physics, mathematics, statistics and engineering.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level and must also have completed prerequisite subjects in quantum mechanics at both second-year and final-year level. Electrodynamics and statistical physics at final-year level are also recommended.

OVERVIEW

It is an exciting time to study physics, being an enabling science that expands our knowledge of the universe and underpins new technologies that will benefit our changing society. The Master of Science (Physics) is a challenging and rewarding experience for students, and you will benefit from our numerous research collaborations worldwide, in both established and emerging areas of physics. Current collaborative partners include CERN in Geneva, the LIGO gravitational wave detector, and the MWA low-frequency radio telescope.

You will be studying at the home of a number of additional research organisations and institutes, including CoEPP and CAASTRO, facilitating unique learning and access in these areas of investigation.

RESEARCH PROJECT

The Physics Research Project is worth 100 credit points, with students undertaking a substantial program of original experimental and/or theoretical research in astrophysics, condensed matter physics, optics or particle physics. Students are required

to make contact with a minimum of three potential supervisors from a minimum of two different research groups/areas and submit evidence of this contact in preference order as part of your application. To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

EMPLOYABILITY

Our graduates go on to careers in:

- Research and development
- Informatics
- Statistics
- Public health
- Meteorology
- Financial modelling and services
- Management consulting
- Engineering
- Information technology
- Forecasting
- Logistics
- Education

Sample course plan

Year 1	Semester 1	Quantum Mechanics	Quantum Field Theory	Research Project Part 1
	Semester 2	Particle Physics	Science Communication	Research Project Part 2
Year 2	Semester 1	Statistical Mechanics	General Relativity	Research Project Part 3
	Semester 2	Quantum & Advanced Optics	Condensed Matter Physics	Research Project Part 4

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

“When I was very young, I was always very excited about understanding how things worked - I would take them apart and look inside, or drop them and see if they bounced. My curiosity extended to all avenues of the sciences, and with further study I found my way to the most fundamental path to understanding, down to the tiniest of constituents. Studying at the University of Melbourne has meant I’ve had the flexibility to find what I enjoy studying the most, and to explore all avenues which interest me.”

Innes Bigaran,
Master of Science (Physics)
Bachelor of Science,
Diploma of Mathematical Science



MASTER OF SCIENCE (VISION SCIENCE)

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: anatomy, cell biology, immunology, neuroscience, ophthalmology, pharmacology, psychology, zoology, biochemistry & molecular biology, computer science, mathematics & statistics, optics, orthoptics, physics, veterinary science, biotechnology, genetics, microbiology, optometry, pathology, physiology and visual science.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark in the best 50 points in the appropriate discipline at third-year level.

OVERVIEW

Vision science is the interdisciplinary study of ocular, systemic and neurological disease, underpinned by foundations in biomedical, computation, statistical or societal expertise. In the Master of Science (Vision Science), you will have the opportunity to explore a field of your choice in-depth, while developing professional and analytical skills to enhance your career. This degree is taught by the Department of Optometry & Vision Sciences through

the Faculty of Medicine, Dentistry & Health Sciences, providing students with access to state-of-the-art resources and support in both teaching and practice.

RESEARCH PROJECT

The Vision Science Research Project comprises most of the degree (125 credit points out of 200 points), and involves experimental research based in the laboratory of an academic staff member from the Department of Optometry &

Vision Sciences. Your specific project will depend upon the availability of appropriate expertise, but may address a broad spectrum of vision science issues. Students are required to find and contact a supervisor prior to applying for this degree. To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

EMPLOYABILITY

Our graduates go on to careers in:

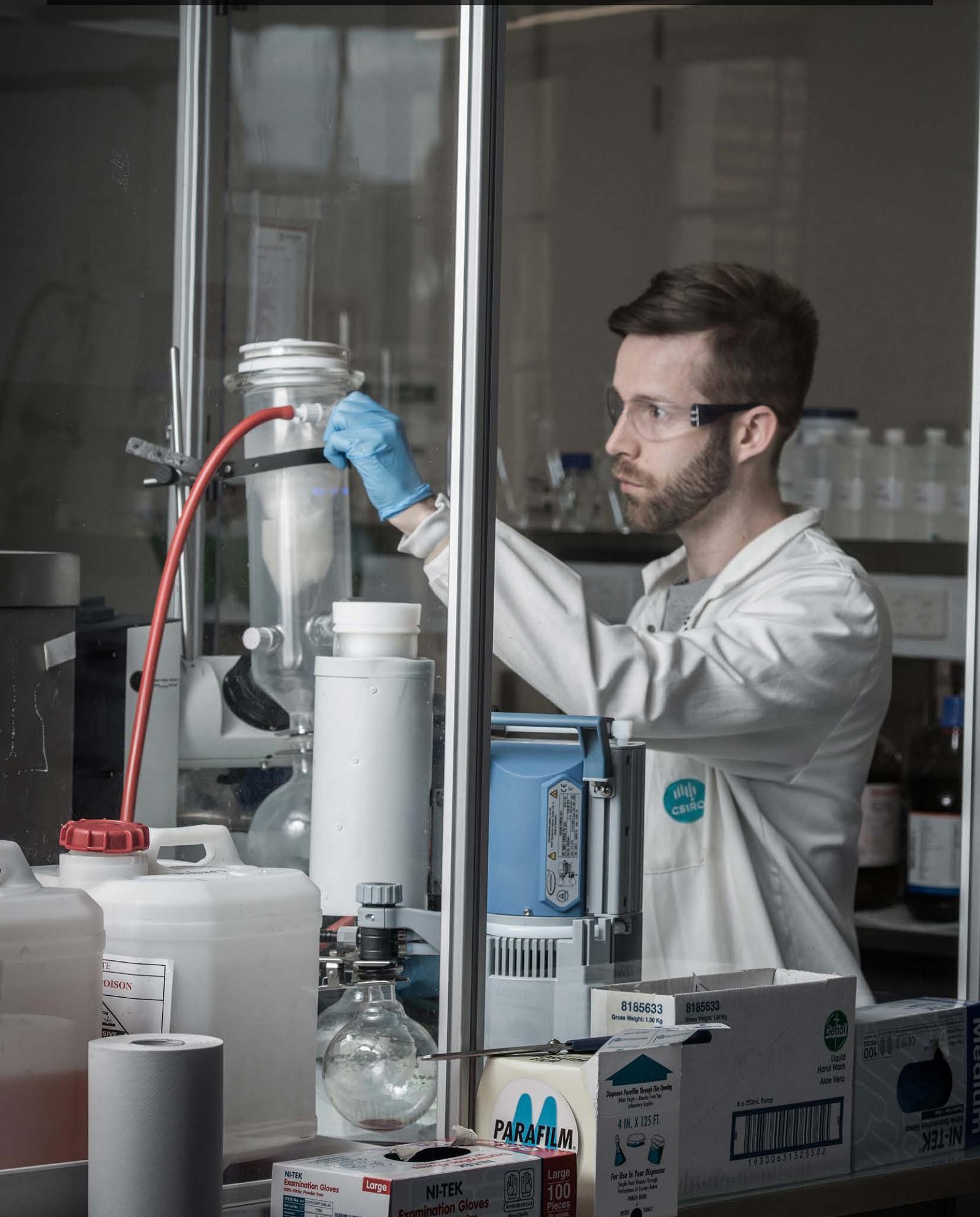
- Vision research and education
- Commercial and government laboratories
- Imaging technology design, sales and consulting
- Scientific and medical industries sales and services
- Commercial, optometric or industrial businesses
- Policy development
- Science outreach and communications



"The Master of Science (Vision Science) has provided me with specialised research skills in my field of interest. In addition to this, I've had the opportunity to expand on my knowledge of basic sciences, and learned valuable skills including critical thinking and team work, which I can apply in the clinic and future research projects."

Mohammadreza Monirtilaki, Master of Science (Vision Science)

This is post-doctoral research fellow Dr Martin Brzozowski conducting experiments in the Catalysis and Flow Chemistry Laboratory within the School of Chemistry. He is currently investigating the development of new chemical processes that harness the power of visible light. His research discoveries will generate new chemical reactions to access novel molecular structures for drug discovery.



MASTER OF BIOTECHNOLOGY

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: any life sciences.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark, and must also have completed an appropriate sequence of at least 25 points (two subjects or equivalent) of second-year level genetics or biochemistry subjects. Applicants must also have completed either GENE30002 or BTCH30002 (or equivalent studies in molecular biology, molecular genetics, genomics and/or bioinformatics) at final-year level.

OVERVIEW

Biotechnology is the use of living organisms or their systems to make products of value. However, without commercialisation and a path to market, most potentially useful discoveries remain unused. In the Master of Biotechnology, you will have access to a higher level of specialised scientific

learning, together with executive skills training and opportunities to take subjects in business, communications and management. You will be based in the heart of the Parkville Biomedical Precinct, learning from leading active researchers in the field and benefiting from our affiliations and linkages across the industry.

EMPLOYABILITY

Biotechnology industries are growing in most industrialised countries, providing a rich variety of employment opportunities. Most roles within a biotechnology company require a scientific background and an understanding of commercial requirements. Our graduates go on to careers in:

- Pharmaceutical management
- Investment analysis
- Quality control
- Food and beverage companies
- Intellectual property management
- Regulatory affairs
- Product development

Sample course plan

Year 1	Semester 1	From Lab to Life	Genomics & Bioinformatics	Data & Decision Making	Project Management in Science
	Semester 2	Advanced Molecular Biology Techniques	Metabolomics & Proteomics	Commercialisation of Science	Scientists, Communication & the Workplace
Year 2	Semester 1	Microscopy for Biological Sciences	Leadership in Science	Genetically Modified Organisms	Industry Project in Biotechnology
	Semester 2	Regulation of Biotechnology	Food Safety & Quality	Tissues Engineering & Stem Cells	Industry Project in Biotechnology

■ Discipline Core
 ■ Elective
 ■ Industry Project

“With the world population ever climbing, biotechnology has the ability to directly answer problems related to the demand for food and medicines as well as many other key global challenges.

I was sitting on the fence in regards to choosing a career in research versus one in industry. The Master of Biotechnology uniquely offered a taste of both and I jumped at the opportunity to explore each option.”

Suvini Perera,
Master of Biotechnology
Bachelor of Science (Honours)

MASTER OF DATA SCIENCE

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February).

Undergraduate majors in the following disciplines are appropriate for entry into this course: computer science, data science and statistics.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark, and must also have completed 12.5 points (one subject or equivalent) of university-level computer science subjects, or a related discipline, with content focused on computer programming. Applicants must have also completed 25 points (two subjects or equivalent) of first-year level mathematics and statistics subjects, including MAST10006 Calculus 2 (or equivalent).

OVERVIEW

The management and analysis of big data are becoming increasingly important in commerce, industry and applied sciences. Data science is a rapidly growing field that has evolved to address this need, and sits at the intersection of statistics and computer science. The newly-established Master of Data Science combines these disciplines in a single coordinated program.

Students will develop the technological abilities and analytical skills needed to manage and gain insights from large and complex collections of data. You will additionally become well-versed in using statistical tools, techniques and methods, along with in-depth analysis and evaluation, to solve real-world problems in the data realm.

EMPLOYABILITY

Graduates of the Master of Data Science will have developed skills in business, technology and mathematics/statistics that are essential and increasingly in demand in many fields of research and industry. This leads to careers in:

- Information technology and communications
- Science research and education
- Health and medical industries
- Business and financial services
- Sales and marketing
- Engineering and mining
- Climate and weather forecasting
- Government

Job titles for data science graduates include business analyst, data analyst, data architect, data engineer, data scientist, marketing analyst, quantitative analyst and statistician, among many others.

Sample course plan - for students satisfying the statistics prerequisites

Year 1	Semester 1	Programming & Software Development	Algorithms & Complexity	Mathematical Statistics	Statistical Modelling
	Semester 2	Internet Technologies	Database Systems & Information Modelling	Computational Statistics & Data Mining	Multivariate Statistical Techniques
Year 2	Semester 1	Knowledge Technologies	Advanced Database Systems	Analysis of High Dimensional Data	Data Science Project
	Semester 2	Statistical Machine Learning	Distributed Systems	Advanced Statistical Methods	Data Science Project

■ Discipline Core (Statistics)
 ■ Discipline Core (Computer Science)
 ■ Capstone
 ■ Prerequisite Package (Computer Science)



“One thing I like about data science, in particular, is that it transforms people into data. Each person can be viewed as a data point. This transformation allows data scientists to obtain many meaningful insights into a wide variety of problems that affect all areas of knowledge. For example, it allows us to make inferences on which genes are associated to a particular disease; it allows us to understand customers better; it allows us to determine which areas of the city have a higher density of cars and require more trees or schools. The list of problems and insights is endless. Data science can indeed transform the life of individuals, businesses and society as a whole.”

Sabrina Rodrigues, PhD student and Associate Data Scientist at the Commonwealth Bank of Australia Master of Science (Mathematics & Statistics)

MASTER OF ENVIRONMENT

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree in a related discipline with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any discipline with at least a 65% (or equivalent) Weighted Average Mark; **AND**

Two years of documented, relevant professional work experience since graduation.

OVERVIEW

The Master of Environment is a truly flexible and multidisciplinary course that enables students to develop tailored skills and knowledge in the broad fields of environment and sustainability. While this degree is administered by the Office for Environmental Programs, depending on your background, interests and ambitions, you will have access to over 200 subjects taught across the nine different faculties at the University. This includes research projects, internship placements, overseas study and collaborative problem-solving projects. You will develop the valuable capacity to work across disciplines to make decisions relating to environmental practice and management.

SPECIALISATIONS

The flexible structure of the Master of Environment means that you can either focus on one of our eleven specialist areas, including sustainable cities, climate change, energy efficiency, environmental science, conservation, and education and social change, or design your own specialisation through our tailored option.

EMPLOYABILITY

Due to the range of specialisations available within the Master of Environment, our graduates go on to a wide variety of rewarding careers in many different areas. Past students have secured competitive graduate

positions with government departments, have gone on to become CEOs of organisations such as the Energy Efficiency Council, and are in senior sustainability positions in their localities. Other positions held by our graduates include:

- Sustainability consultant
- Senior policy advisor
- Climate change adaptation advisor
- Researcher
- Environmental designer
- Land management officer
- Environmental scientist

Among the key employers of our graduates are the Department of Environment, Land, Water & Planning, Aurecon, Melbourne Water, ARUP, Australian Wildlife Conservancy and URS Australia.

Sample course plan – climate change specialisation

Year 1	Semester 1	Sustainability, Governance & Leadership	Adapting to Climate Change	Environment & Knowledge	Foundations of Spatial Information
	Semester 2	Environmental Policy Instruments	Climate Change & Mitigation	Climate Change Politics & Policy	Green Infrastructure for Liveable Cities
Year 2	Semester 1	Sustainability & Behaviour Change	The Politics of Food	Energy for Sustainable Development	Environmental Impact Assessment
	Semester 2	Interdisciplinarity & the Environment	Sustainable Buildings	Industry Internship	

■ Discipline Core
 ■ Capstone/Research
 ■ Elective
 ■ Compulsory Specialisation

“Coming from a commerce and economics background, the diversity in the Master of Environment was exactly what I needed to form an extremely well-rounded knowledge base for a future career. I focused on relating environment and sustainability to business, particularly in the social enterprise area. I was able to take subjects in architecture, science, horticulture and agriculture, among others, all of which collectively helped me form the right mindset to go into the world and create change holistically.

I now work full time in the innovation lab at the City of Melbourne where I look at new, innovative ways to solve not only environmental but all sorts of problems at the local government level.”

Kunal Khanna, Master of Environment



MASTER OF ENVIRONMENTAL SCIENCE

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February).

Undergraduate majors in the following disciplines are appropriate for entry into this course: biological sciences, chemistry, earth sciences, forest science, geography, statistics and agricultural science.

Applicants must have at least a 65% (or equivalent) Weighted Average Mark.

OVERVIEW

The University of Melbourne is ranked number 15 in the world for the study of environmental science (*QS World University Rankings by Subject 2016 – Environmental Sciences*). The Master of Environmental Science is designed for students with existing undergraduate studies in the life, chemical, earth or environmental sciences to extend their scientific knowledge of environmental problems, and to facilitate the development of professional scientific skills in environmental problem solving.

You will have the flexibility to develop your own interests by selecting from a broad range of coursework subjects. You will undertake high-level and intensive study in your chosen area, as well as building complementary professional skills in the areas of communication, business and science application. The Master of Environmental Science is a newly-established course and will be first available to students in 2017.

EMPLOYABILITY

The Master of Environmental Science can lead to a wide variety of careers, including:

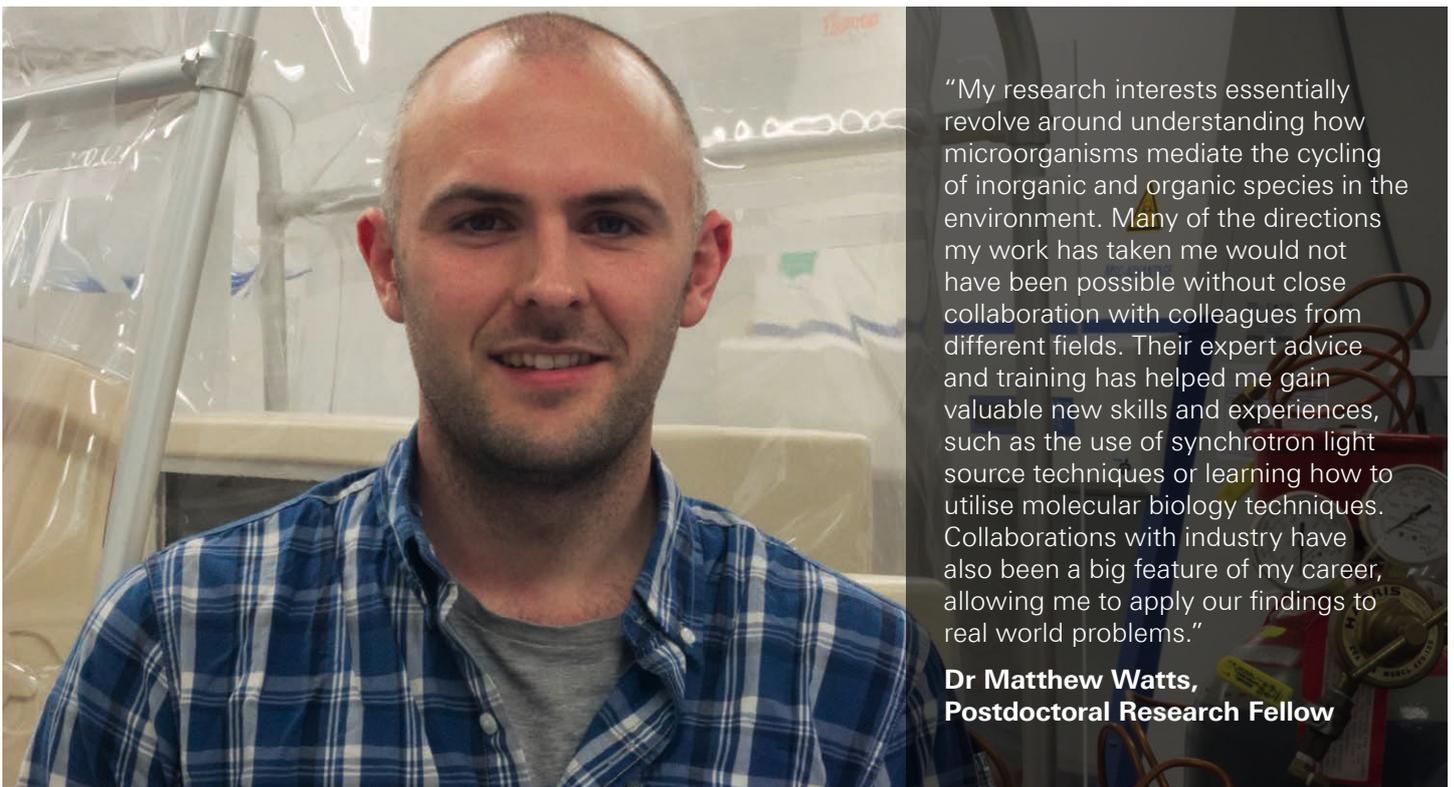
- Hydrogeologist
- Hydrogeochemist
- Geological modeller/Basin analyst
- Geotechnical laboratory operator/manager
- Geotechnical field technician
- Well site geologist
- Project manager
- Environmental planner/GIS specialist
- Mine site rehabilitation specialist
- Environmental impact assessor
- Environmental regulation specialist
- Environmental policy developer

These roles are typically found in water and environmental consultancies, resource companies and governments.

Sample course plan

Year 1	Semester 1	Global Environmental Change	Integrated River and Catchment Management	Thinking and Reasoning with Data	Environmental Modelling
	Semester 2	Problem Solving in Environmental Science	Climate Affairs	Science Communication	Analytical and Environmental Chemistry
Year 2	Semester 1	Ethics and Responsibility in Science	Industry Project in Environmental Science	Coastal Landforms and Management	Hydrogeology/ Environmental Geochemistry
	Semester 2	Graduate Seminar: Environmental Science	Industry Project in Environmental Science	China Field Trip	

■ Discipline Core
 ■ Professional Skills Subject
 ■ Elective
 ■ Other



“My research interests essentially revolve around understanding how microorganisms mediate the cycling of inorganic and organic species in the environment. Many of the directions my work has taken me would not have been possible without close collaboration with colleagues from different fields. Their expert advice and training has helped me gain valuable new skills and experiences, such as the use of synchrotron light source techniques or learning how to utilise molecular biology techniques. Collaborations with industry have also been a big feature of my career, allowing me to apply our findings to real world problems.”

**Dr Matthew Watts,
Postdoctoral Research Fellow**

MASTER OF FOREST ECOSYSTEM SCIENCE

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and may be available at mid-year (July).

Applicants must have an undergraduate degree in a related discipline with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any discipline with at least a 65% (or equivalent) Weighted Average Mark that includes at least 25 points (two subjects or equivalent) in one or more of chemistry, biology, mathematics or statistics subjects; **OR**

An undergraduate degree in any area and a Graduate Certificate in Environment with at least a 65% (or equivalent) Weighted Average Mark; **OR**

A two-year associate degree or diploma in a relevant discipline; **AND**

Five years documented, relevant professional experience; **AND**

An appropriate level of performance on a test conducted by the Selection Committee to confirm generic skills necessary for successful study in the program.

to conduct crucial experimental work in the field. You will also benefit from our connections and the potential experiences available within forest, land and fire agencies, and non-government organisations.

EMPLOYABILITY

Our graduates are well-prepared for high-level positions with the forest and natural resource management sectors, and go on to careers in:

- Forest and environmental management
- Ecological consulting
- Timber management and processing
- Land care
- Wildlife conservation
- Climate change science and policy
- Forest carbon investment and accounting
- Aid and development
- Primary industry investment

OVERVIEW

Forested landscapes play a critical role in sustaining human and other biological communities. They provide wildlife habitat, biodiversity, timber, clean water and other ecosystem services and play a central role in mitigating rapid climate change. The Master of Forest

Ecosystem Science provides students with the knowledge, skills and analytical capabilities to shape the development of forest and natural resource management enterprises world-wide. You will learn about climate change science, water resource management and biodiversity conservation, and develop the ability

Sample course plan

Year 1	Semester 1	Forest Ecosystems	Research Philosophies & Statistics	Tree Identification & Selection	Bushfire Planning & Management
	Semester 2	Trees in a Changing Climate	Sustainable Forest Management	Silviculture & Forest Dynamics	Farm Trees & Agroforestry
Year 2	Semester 1	Bushfire & Climate	Managerial Psychology	Forest Assessment & Monitoring	Short Research Project B
	Semester 2	International Forest Policy	Ecological Restoration	Timber, Sustainable & Renewable Material	Short Research Project B

Discipline Core Research Project Elective



"I've always had an interest in the natural environment and forests in particular, and I wanted to learn more about forest ecosystems and be able to apply that knowledge in a management context. Studying at the University of Melbourne has been fantastic; being able to interact with researchers who are leaders in their field and students who are inspired to learn and expand their knowledge."

Jamie Burton,
Master of Forest Ecosystem Science
Bachelor of Science

MASTER OF GEOGRAPHY

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and may be available at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: geography, ecology and evolutionary biology, environmental science, earth, ocean and/or atmospheric science, zoology, anthropology, urban studies, social science, economics and political science.

Applicants must have at least a 70% (or equivalent) Weighted Average Mark.

OVERVIEW

Geography is a strongly fieldwork-oriented discipline that extends across the social and natural sciences. This is an area of growing interest as we meet the challenges arising from significant changes in our physical environment and the social, economic and political implications of those changes. The newly-established Master of Geography provides comprehensive grounding across all major sub-disciplines of contemporary geographic study; physical, human and integrated.

Students specialise in one of these three streams, and will choose either a coursework-only option of study or one of two coursework-plus-thesis options (comprising of a 50 point research project or a 100 point research project). You will also have access to numerous field-based subjects, allowing you to experience and build the field skills that are essential to the study of applied geography.

The Master of Geography is replacing the Master of Science (Geography) as of 2017.

EMPLOYABILITY

Geographers are employed in fields including:

- Natural resource/climate change management with national parks, catchment management authorities, soil conservation and related land management services, forestry companies, and coastal land management organisations
- Research with CSIRO, Geoscience Australia, universities and research arms of government departments
- Urban planning/sustainability with councils and state government organisations
- International development/policy with charitable and government aid organisations, including the United Nations

Sample course plan - Physical Geography stream

Year 1	Semester 1	Contemporary Geographical Thought	Geography Research Methods	Ethics & Responsibility in Science	Environmental Impact Assessment
	Semester 2	Geography Practical	Social Impact Assessment & Evaluation	Climate Change Politics & Policy	Environmental Risk Assessment
Year 2	Semester 1	Geography Minor Research Project Part 1		Thinking & Reasoning with Data	Biogeography & Ecology of Fire
	Semester 2	Geography Minor Research Project Part 2		The Disaster Resilient City	East Timor Field Class

■ Discipline Core
 ■ Professional Skills Subject
 ■ Research Project
 ■ Elective

“The highlight of my studies so far has been the opportunity to pursue field work in a wide variety of settings. Throughout my degree, I’ve worked in the field along all stretches of the Victorian coast, inland Victoria, the Flinders Ranges, the Nullarbor and Northern Tasmania.

Studying at the University of Melbourne has meant the combination of opportunities to study a wide variety of landscapes with enthusiastic students, while learning from driven staff who love their field of research and pass that passion onto their students.”

Thomas Savige,
Master of Science (Geography)
Bachelor of Science



MASTER OF GEOSCIENCE

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Undergraduate majors in the following disciplines are appropriate for entry into this course: earth science and geology.

Applicants must have an undergraduate degree in a related area with at least a 65% (or equivalent) Weighted Average Mark.

OVERVIEW

The Master of Geoscience is a newly-established course designed to expand upon undergraduate studies in the field of geoscience, geology or earth sciences. You will have the opportunity to explore specialised streams of geoscience, including economic geology, environmental geoscience, energy, and earth structure and geophysics, and learn from leading academics and industry professionals in the field.

Through shared teaching programs established with leading universities at both a local and national level, you will have access to a range of core and elective subjects being taught across the geoscientific disciplines.

EMPLOYABILITY

The Master of Geoscience can lead to a wide variety of careers in areas including:

- Research for academia, government and industry
- Resources industries, such as minerals, petroleum and gas
- Consulting on mining, environmental factors and geophysical factors
- Climate change mitigation
- Hydrogeology
- Natural hazard mitigation
- Education industry
- Independent business
- Geotechnical industries
- Engineering

Sample course plan

Year 1	Semester 1	Practical Earth Science A		Geochemistry & Petrogenesis		Hydrogeology	Geochronology & Thermochronology	Environmental Geochemistry
	Semester 2	Environmental Geology Field Techniques	Fundamentals of Geological CO2 Storage	Sedimentary Geology		English Language Subject OR Applied Geophysics	Commercialisation of Science	
Year 2	Semester 1	Practical Earth Science B		Advanced Structural Mapping	Coastal Environmental Geomorphology	Science Communication	Ethics & Responsibility in Science	
	Semester 2	Project in Geoscience				Economic Geology	Statistics for Research Workers	

■ Discipline Core ■ Professional Skills Subject ■ Capstone Project

Please note: Some subjects may incur additional travel/lab/field excursion costs. For individual subject information, visit: handbook.unimelb.edu.au.



MASTER OF URBAN HORTICULTURE

ENTRY REQUIREMENTS

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree or a graduate certificate in any discipline with at least a 65% (or equivalent) Weighted Average Mark.

OVERVIEW

In an increasingly urbanised world, high quality, multi-functional urban green spaces and urban forests are increasingly important for environmental, economic, social and health benefits. The Master of Urban Horticulture is your entry into this growing field. The course is unique in the Southern Hemisphere and is delivered primarily at our beautiful Burnley Gardens campus. You will explore contemporary issues in urban

landscape management, including climate change adaptation strategies, green infrastructure implementation and community engagement through horticulture, while studying and working alongside some of the most prominent and respected urban horticulturalists and ecologists in Australia.

EMPLOYABILITY

Many of our graduates choose to work in hands-on fields as arborists or horticulturalists, while others are self-

employed consultants and designers or work for local and state governments and their agencies. Jobs held by some of our graduates include:

- Landscape officer
- Open space planner
- Garden writer and editor
- Urban forest consultant
- Parks manager
- Kitchen garden educator
- Garden designer
- Nursery operations manager
- Gardens curator
- Horticultural consultant
- Green roofs technician

Sample course plan

Year 1	Semester 1	Plants in the Landscape	Horticulture Plant Science	Plants & the Urban Environment	Landscape Design
	Semester 2	Plant Production & Establishment	Managing Urban Trees	Urban Soils, Substrates & Water	Managing Innovation & Change
Year 2	Semester 1	Food Production for Urban Landscapes	Horticultural Internship	Water Sensitive Urban Design	Therapeutic Landscapes
	Semester 2	Managing Urban Landscapes	Urban Horticultural Issues & Perspectives	Ecological Restoration	Green Roofs & Walls

Discipline Core
 Professional Skills Subject
 Elective



“Studying at the University of Melbourne has broadened my view of the field of horticulture and given me the skills for employment in a variety of horticultural-related jobs. Being in an immersive environment like Burnley has been great for a passionate plant person.”

**Fiona Webber,
Master of Urban
Horticulture**

Fiona was awarded second place at the 2016 Melbourne International Flower & Garden Show in the ‘Avenue of Achievable Gardens’ for her installation ‘Kidsense’ (pictured).



The Faculty of Science houses a number of world-leading instruments like the next-generation Thermo Fisher ARGUSVI multi-collector noble gas mass spectrometer. This instrument, which is used to date rock and mineral samples using high-precision Ar-Ar (Argon-Argon) geochronology, is 10 times more precise than any previous instrument. It was the first of its kind installed outside the Thermo Fisher factory and represents the first major breakthrough in noble gas analytical capability in the last 25 years. Dr Erin Matchan (pictured with PhD student Michael Heath) uses the machine, located in the School of Earth Sciences, to date the eruption histories of individual volcanos.

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GRADUATE RESEARCH DEGREES

The Faculty of Science offers two graduate research degrees, the Master of Philosophy (MPhil) and the Doctor of Philosophy (PhD).

MASTER OF PHILOSOPHY

The Master of Philosophy (MPhil) is an internationally recognised masters by research degree, designed to develop advanced skills in carrying out independent and sustained research that makes an independent contribution to existing scholarship. You will study under one or more supervisors who are experts in their fields, and produce an in-depth and comprehensive thesis of 30,000-40,000 words that demonstrates critical application of specialist knowledge in an area of research. You will choose from seven available areas of study: BioSciences, Chemistry, Earth Sciences, Ecosystem & Forest Sciences, Geography, Mathematics & Statistics, and Physics.

DOCTOR OF PHILOSOPHY

The Doctor of Philosophy (PhD) is the University of Melbourne's premier research degree, developing graduates who demonstrate academic leadership, independence, creativity and innovation in research, which will build your status as a specialist in your chosen discipline. You will study under one or more supervisors who are experts in their fields, and produce an in-depth and comprehensive thesis of approximately 80,000 words that makes a distinct and original contribution to scientific knowledge. You will choose from seven available areas of study: BioSciences, Chemistry, Earth Sciences, Ecosystem & Forest Sciences, Geography Mathematics & Statistics, and Physics.

"My work seeks to extend our knowledge of rocks formed deep in mountain belts. My fieldwork is enabling me to discover how minerals form at high-temperatures as well as the formation conditions of Madagascar and the supercontinent Gondwana. The highlight of my studies so far has been this fieldwork in Madagascar, collecting my own samples and choosing field locations."

**Catherine Wheller, PhD student
Bachelor of Science (Honours)**



APPLICATIONS FOR GRADUATE RESEARCH

STEP 1 – CHECK YOUR ELIGIBILITY

To be considered for entry into either an MPhil or a PhD, you must have completed:

- A four-year bachelors degree in a relevant discipline that includes a substantial research component equivalent to at least 25% of one year of full-time study and have achieved a Weighted Average Mark of 75% (or equivalent) in the final year subjects; **OR**
- A masters degree in a relevant discipline which includes a substantial research component equivalent to at least 25% of one year of full-time study and achieved a Weighted Average Mark of 75% (or equivalent); **OR**
- A qualification and relevant professional research experience considered to be equivalent; **AND**
- Provide referee reports (except for applicants who have graduated from the University of Melbourne within the last five years)
- Have obtained the endorsement of a prospective supervisor

STEP 2 – FIND A PROSPECTIVE SUPERVISOR

Before submitting an application, you are required to have the support of a nominated academic supervisor. If you have not previously studied at the University of Melbourne, you must include an email of support from a nominated supervisor with your application. To identify an academic who is best suited to your intended area of research, visit: science.unimelb.edu.au/research/research-themes or findanexpert.unimelb.edu.au.

When you email a prospective supervisor you should include your:

- Intended area of research
- CV/resume
- All higher education transcripts

STEP 3 – REVIEW FEE INFORMATION

Domestic students

Australian or New Zealand citizens enrolled in graduate research, on a full time or part-time basis, are eligible to be considered for the Research Training Scheme (RTS).

This scheme provides an exemption from tertiary fees for a maximum of four years full-time (eight years part-time) for the PhD, and two years full-time (four years part-time) for the MPhil. For more information about the RTS, visit: education.gov.au/frequently-asked-questions-research-training-scheme-rts.

International students

Recipients of either a Melbourne Research Scholarship (MRS) or International Postgraduate Research Scholarship (IPRS) will receive a fee remission and are not required to pay for tuition. Information on tuition fees on the basis of one year of full-time study (1 EFTSL) and indicative total course fees can be found at futurestudents.unimelb.edu.au/admissions/fees.

"I have developed a novel method (less-invasive, fast and reliable) to assess the growth rates and age of urban trees. Since traditional methods of dendrochronology are time-consuming, require specialised equipment and software and, ultimately, the coring points may function as potential entry points for wood decay fungi, the development of this method is clearly beneficial for arborists. I have studied quite old trees within the Melbourne's urban forest; some of them are 135 years old, healthy and growing at 2.2 mm per year, which is pretty wonderful."

Luis Orozco Aguilar, PhD student



STEP 4 – CHECK SCHOLARSHIP INFORMATION AND DEADLINES

The University of Melbourne has a range of scholarships, awards and other funding opportunities available to graduate students, both domestic and international. The Faculty of Science also has specific scholarships and awards available.

Scholarships may be based on merit, or needs and circumstances, and range from one-off payments to annual stipends, full tuition waivers and funding for specific activities/items, such as relocation, residential costs or overseas study. For a full list of scholarships and further information, visit: science.unimelb.edu.au/students/scholarships.

Melbourne Research Scholarship (MRS)

Melbourne Research Scholarships are funded by the University of Melbourne and awarded to eligible domestic and international students who undertake a graduate research degree. International students in receipt of an MRS will also receive a fee remission scholarship. To be competitive for an MRS, you must have consistent results of at least 75% (or equivalent). Applicants who can demonstrate a significant role in a research publication(s) and/or significant work experience will have this factor taken into consideration when determining scholarship eligibility.

Australian Postgraduate Award (APA)

Australian Postgraduate Awards (APA) are funded by the Australian Federal Government and awarded to eligible domestic students who undertake a graduate research degree. To be competitive for an APA, you must have consistent and strong results of at least 80% (or equivalent). Applicants who can demonstrate a significant role in a research publication(s) and/or significant work experience will have this factor taken into consideration when determining scholarship eligibility.

International Postgraduate Research Scholarship (IPRS)

International Postgraduate Research Scholarships are funded by the Australian Federal Government and awarded to international students who undertake a graduate research degree. An IPRS covers full tuition fees for the duration of the course, and the annual Overseas Student Health Cover (OSHC). Students awarded an IPRS will normally also receive an Australian Postgraduate Award (APA). This provides a living allowance, thesis allowance and other benefits.

The entry requirements for a scholarship are normally higher than the entry requirements of the course. To be competitive for an IPRS, you must have very strong results of at least 90% (or equivalent). Applicants who can demonstrate a significant role in a research publication(s) and/or significant work experience will have this factor taken into consideration when determining scholarship eligibility.

For deadlines and dates of notification for APA, MRS and IPRS applications, visit:

courses.science.unimelb.edu.au/study/degrees/master-of-philosophy-science/fees-scholarships OR
courses.science.unimelb.edu.au/study/degrees/doctor-of-philosophy-science/fees-scholarships.

STEP 5 – PREPARE YOUR DOCUMENTATION

To ensure your application is assessed without delay, the following documentation should be attached in your online application:

- A current CV
- Copies of all higher education transcripts, completion statements (if relevant) and grading schemes showing numeric grades
- Employer Referee Report Form – only applicable if relevant work experience is either at least five years in duration or at least one year full time research based. You should send your referees these forms well in advance of submitting your application.
- A copy of an email or letter indicating that your nominated supervisor has agreed to support your application
- Two Academic Referee Report Forms. You should send your referees these forms well in advance of submitting your application
- Examiner's reports and thesis, or abstract of thesis, if you have completed a thesis or research component that does not include a numeric grade in your transcripts.

If you are currently completing a degree, we recommend that you apply before the application deadline to ensure the highest chance of success in obtaining a scholarship.

STEP 6 – SUBMIT YOUR APPLICATION

Submit an application online by visiting: futurestudents.unimelb.edu.au/admissions/applications/online-application-info.

Once you have submitted your application you will receive an email stating that your application has been received and is being assessed.

If your most recent, relevant qualification is complete at the time of submitting your application, then you can expect to receive a formal outcome within approximately 12 weeks of submission.

If your most recent degree is incomplete at the time of submission, then assessment will not commence until your application is confirmed as being complete. You will receive notification that your application has been placed on hold and further instructions about where to provide the required documents.



PhD student Karen Muscat uses the Leap Aptus II camera in the University of Melbourne Herbarium to generate high resolution images of herbarium specimens.

Karen is doing a PhD on the flax lily genus *Dianella* to investigate the global evolutionary relationships using molecular phylogenetics. She is also investigating the morphological variation in the *D. caerulea* complex in eastern Australia.

CERTIFICATES & DIPLOMAS

GRADUATE CERTIFICATE IN SCIENCE

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree and at least 37.5 points (three subjects or equivalent) of specific prerequisite subjects at second-year level or above for the stream into which entry is sought.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate in Science is intended for students who have completed an undergraduate degree and want to expand knowledge in a specific area, or re-focus knowledge in a different area within the sciences. You may then be able to progress to a range of graduate coursework programs, in particular the Master of Science in a relevant stream.

You can choose to study one of the following areas: applied mathematics, botany, chemistry, computer science, discrete mathematics/operations research, genetics, geology, human geography, integrated geography, medicinal chemistry, physical geography, physics, pure mathematics, statistics/stochastic processes or zoology.

GRADUATE DIPLOMA IN SCIENCE

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree and at least 25 points (two subjects or equivalent) of specific prerequisite subjects at first-year level or above for the stream into which entry is sought.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Diploma in Science is designed for students who have taken undergraduate subjects in a particular discipline but did not complete the major. You will be able to complete the equivalent of this major in order to pursue a Master of Science in that discipline.

You can choose to study one of the following areas: applied mathematics, botany, chemistry, computer science, discrete mathematics/operations research, genetics, geology, human geography, integrated geography, medicinal chemistry, physical geography, physics, pure mathematics, statistics/stochastic processes or zoology.

GRADUATE DIPLOMA IN SCIENCE (ADVANCED)

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July). Applicants must have an undergraduate degree and appropriate prerequisite subjects for the stream into which entry is sought. Students intending to undertake research may need to find a supervisor prior to applying, depending on the stream of admission. To determine whether you would need to find a supervisor, check the Master of Science page of the relevant stream. To search a range of available supervisors, visit: findanexpert.unimelb.edu.au.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Diploma in Science (Advanced) is a potential pathway to a graduate research degree. It enables you to acquire research skills and develop current, in-depth knowledge in a scientific field.

You can choose to study one of the following areas: botany, chemistry, computer science, earth sciences, genetics, mathematics & statistics, physics or zoology.



GRADUATE CERTIFICATE IN PROFESSIONAL SKILLS FOR SCIENTISTS

Entry Requirements

Entry to this program is available in Semester 1 (February) may be available at mid-year (July).

Applicants must have an undergraduate science degree.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate in Professional Skills for Scientists provides science graduate students with specialist training in organisational management, communication and leadership across a broad range of settings. Students study coursework subjects designed to provide the broad, transferable and practical skills and learning outcomes that the market demands, and that are appropriate for enhancing employability in any business or organisation that requires the expertise of science graduates. These subjects develop theoretical and practical knowledge, such as decision-making, motivating and leading people, and developing communication strategies. This course is designed to be taken concurrently with another graduate degree including a PhD, or by itself after completion of the BSc.

GRADUATE CERTIFICATE IN ARBORICULTURE

Entry Requirements

Entry to this program is available in Semester 1 (February).

Applicants must have an undergraduate degree; **OR**

A relevant TAFE or Higher Education Advanced Diploma and three years documented relevant work experience; **OR**

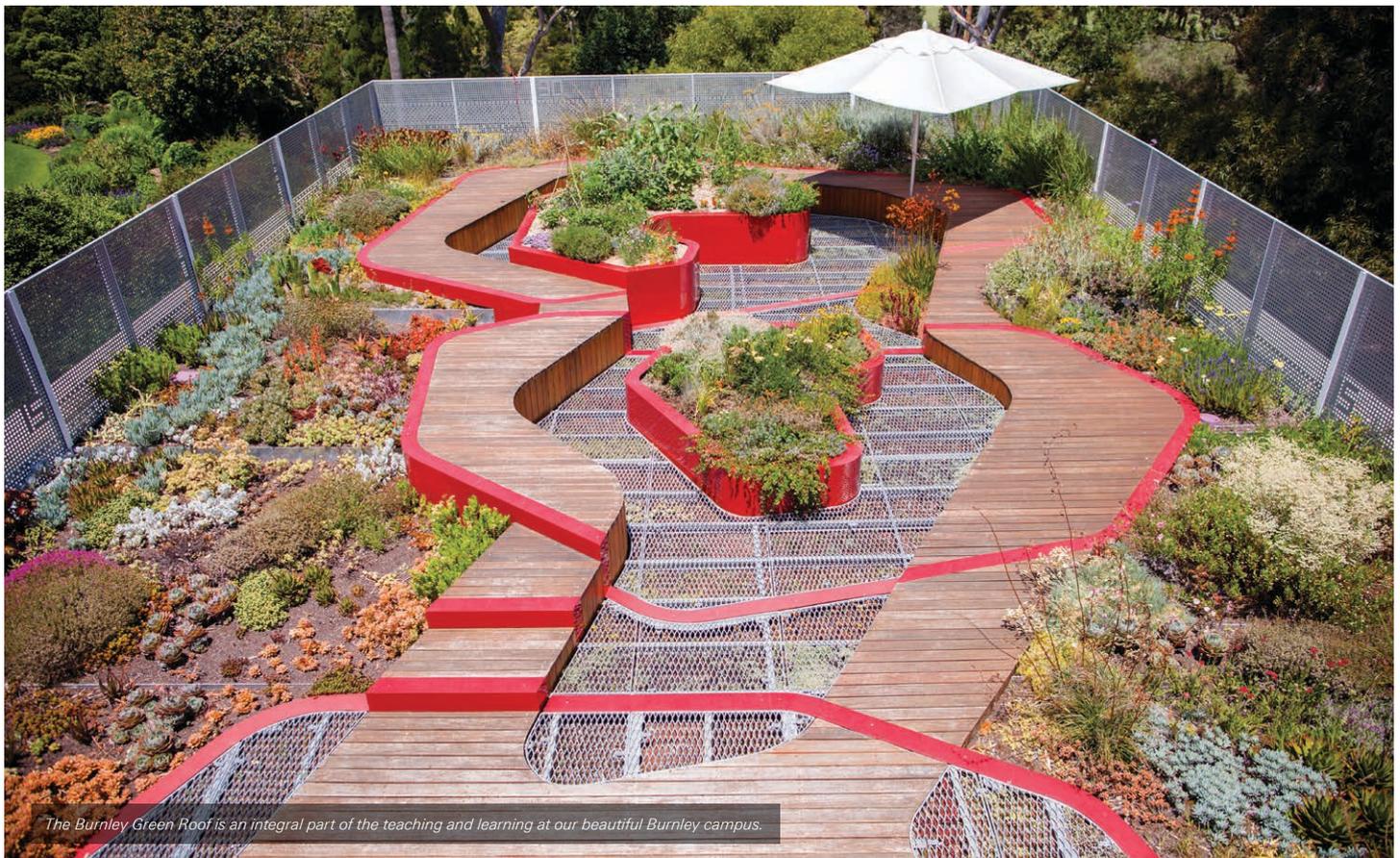
A relevant TAFE Diploma and four and a half years relevant, documented work experience; **OR**

At least six years of documented relevant work experience, including at least three years in a demonstrated supervisory role.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate in Arboriculture is designed for professionals currently managing, or planning to learn how to manage, urban trees. This course investigates a wide range of tree management issues and emphasises the need to promote a strategic approach to tree management and the contribution trees can make to urban life. It aims to increase understanding of current issues in urban tree management through studies in growth and function, identification and selection, pests and diseases, and environmental stressors.

This course is taught at our Burnley campus.



The Burnley Green Roof is an integral part of the teaching and learning at our beautiful Burnley campus.

GRADUATE CERTIFICATE/DIPLOMA IN BUSHFIRE PLANNING & MANAGEMENT

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree in a relevant discipline with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any area including at least 25 points (two subjects or equivalent) in one or more of chemistry, biology, mathematics or statistics with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any area and a Graduate Certificate in Environment with at least a 65% (or equivalent) Weighted Average Mark in the certificate; **OR**

A two-year associate degree or diploma in a relevant discipline, at least five years documented, relevant professional experience and an appropriate level of performance on a test conducted by the Selection Committee to confirm generic skills necessary for successful study in the program.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate and the Graduate Diploma in Bushfire Planning & Management combine specialised bushfire science with urban planning, design and construction, and fire management subjects. These courses meet the urgent need to equip existing professionals with the world's best practice skills in managing fire risk across the urban-natural environment interface. You will have the opportunity to develop professional networks in the fire risk management area, and to consolidate your learning through participating in case studies.

There are two specialist streams available:

The bushfire planning stream is developed for people who have a role in either the design or regulation of development in a bushfire environment, such as planners, building surveyors, engineers and architects. Through this stream you will learn aspects of bushfire knowledge, from building planning to regulation.

The bushfire management stream is developed for environmental scientists, natural resource managers and bushfire consultants, and will qualify you for specialist fire management positions within the forest and natural resource sectors. In this stream you will study specialised subjects that cover biodiversity, ecosystem processes, climate change implications for bushfire risk mitigation, and community natural resource management including engagement and negotiation skills.

This course is taught at our Creswick campus.

GRADUATE CERTIFICATE/DIPLOMA IN FOREST SYSTEMS MANAGEMENT

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree in a relevant discipline with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any area including at least 25 points (two subjects or equivalent) in one or more of chemistry, biology, mathematics or statistics with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An undergraduate degree in any area and a Graduate Certificate in Environment with at least a 65% (or equivalent) Weighted Average Mark in the certificate; **OR**

A two-year associate degree or diploma in a relevant discipline, at least five years documented, relevant professional experience and an appropriate level of performance on a test conducted by the Selection Committee to confirm generic skills necessary for successful study in the program.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate and the Graduate Diploma in Forest Systems Management will develop your knowledge and practical skills for in managing forest resource enterprises, and provide you with key networks in this sector nationally. All subjects within the Graduate Certificate, and most subjects within the Graduate Diploma, are offered as short-stay intensives supplemented by self-directed study. The Graduate Diploma also enables students to undertake a forest sector internship in national or international settings, allowing you to gain firsthand experience and insight into a challenging aspect of forest management.

Throughout these courses, you will gain an understanding of forest systems and their management, incorporating environmental, economic and social aspects. These courses qualify graduates for specialist forest management positions within the forest and natural resource management sectors, and provide a pathway to further study.

This course is taught at our Creswick campus.

GRADUATE CERTIFICATE IN GARDEN DESIGN

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree; **OR**

A relevant TAFE or Higher Education Advanced Diploma and three years documented relevant work experience; **OR**

A relevant TAFE Diploma and four and a half years relevant, documented work experience; **OR**

At least six years of documented relevant work experience which demonstrates the capacity to successfully undertake the course.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Certificate in Garden Design is ideal for people employed in the horticulture or landscape industries, as well as career changers and gardening enthusiasts. Held predominantly in evenings and on weekends, this course will provide you with an understanding of garden design theory and practice, horticultural principles, and skills in plant selection and use.

This course is taught at our Burnley campus. This course is not available to international students who require a student visa to study in Australia.

SPECIALIST CERTIFICATE IN GREEN ROOFS & WALLS

Entry Requirements

Entry to this program is available at mid-year (July).

Applicants must have an undergraduate degree; **OR**

A relevant TAFE or Higher Education Advanced Diploma and three years documented relevant work experience; **OR**

A relevant TAFE Diploma and four and a half years relevant, documented work experience; **OR**

At least six years of documented relevant work experience, including at least three years in a demonstrated supervisory role.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

Delivered through two intensive subjects, the Specialist Certificate in Green Roofs & Walls will provide you with a thorough understanding and knowledge of green roofs and walls through analysing and evaluating current research and advances in policy and planning, design and specification, implementation and construction, and monitoring and management. You will gain hands-on experience in substrate and plant selection and learn how design choices influence performance, management and maintenance.

This course is taught at our Burnley campus. This course is not available to international students who require a student visa to study in Australia.

GRADUATE DIPLOMA IN URBAN HORTICULTURE

Entry Requirements

Entry to this program is available in Semester 1 (February) and at mid-year (July).

Applicants must have an undergraduate degree or graduate certificate in any discipline with at least a 65% (or equivalent) Weighted Average Mark; **OR**

An honours degree or graduate diploma in any discipline.

Students must also meet the University of Melbourne's English language requirements. For more information about these requirements, visit: futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements.

The Graduate Diploma of Urban Horticulture is designed to fulfil the needs and demands of those who have qualifications in disciplines other than horticulture and who wish to emphasise the study of the horticultural system from a technological, sociological and management perspective. You will develop your knowledge and skills in the design, implementation and management of urban landscapes.

This course is taught at our Burnley campus.



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Authorised by: Manager, Academic Engagement, Faculty of Science, July 2016

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Cover photography

Photomicrograph of a 30 micron slice of granite under cross-polarised light. Minerals include biotite, muscovite, feldspars and quartz. Field of view is ~ 3 mm. By investigating rocks at this scale, geologists can find out what type of rock it is, how it formed and where it originated. Photo taken with a Leica ICC50W microscope at the School of Earth Sciences.

