



The University of Sydney

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Postgraduate guide 2017
Engineering and
Professional Engineering



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Postgraduate guide 2017

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Where will postgraduate study lead you?

Engineering and professional engineering

Whether you want to gain an edge in your career, change your direction or pursue a passion, the University of Sydney will steer you to places you never imagined.



“The Australian Research Council Training Centre I am involved with includes researchers from engineering, agriculture, science and medicine, as well as international collaborators and 10 food and biotechnology industry partners.”

Professor Fariba Dehghani

Co-director of the Australian Research Council Training Centre for the Australian Food Processing Industry in the 21st Century

With hundreds of postgraduate courses on offer, we make it easy for you to tailor a degree to your personal needs and professional goals.

Our coursework and research degrees offer far more than knowledge. You'll join leading thinkers to challenge the known and explore the unknown, in a stimulating environment that encourages both learning and networking.

We give you access to leading lecturers, research supervisors, industry networks, research and teaching centres, and a global network of respected alumni. This is one of the reasons why many of our graduates go on to change lives for the better, and why we are regularly ranked in the top 50 universities worldwide.* For engineering and technology, the University is ranked among the top 30 in the world.**



“We have been conducting research in autonomous remote sensing and developing robotics and intelligent software for the environment and agriculture community for more than a decade. We are working on a project with AUSVEG and Horticulture Innovation Australia to develop small, affordable robotic farming devices to give farmers tools to help better manage their farms.”

Professor Salah Sukkarieh
Director of Research and Innovation at the Australian Centre for Field Robotics

Connected with industry

At the Faculty of Engineering and Information Technologies we understand the importance of working closely with industry. Our courses are designed with, and taught by, industry professionals. We partner with leaders from business, industry and academia.

Our expertise and facilities are highly sought after, with our staff invited to provide professional consulting services for many businesses and government agencies.

Multidisciplinary strengths

By uniting expertise across disciplines, we make a real difference to our understanding of today’s world. We attract a diverse group of leading researchers from around the globe and provide an environment that encourages collaboration and innovation. Our research breaks down conventional disciplinary barriers to develop truly holistic solutions to today’s big issues.

Globally recognised qualifications

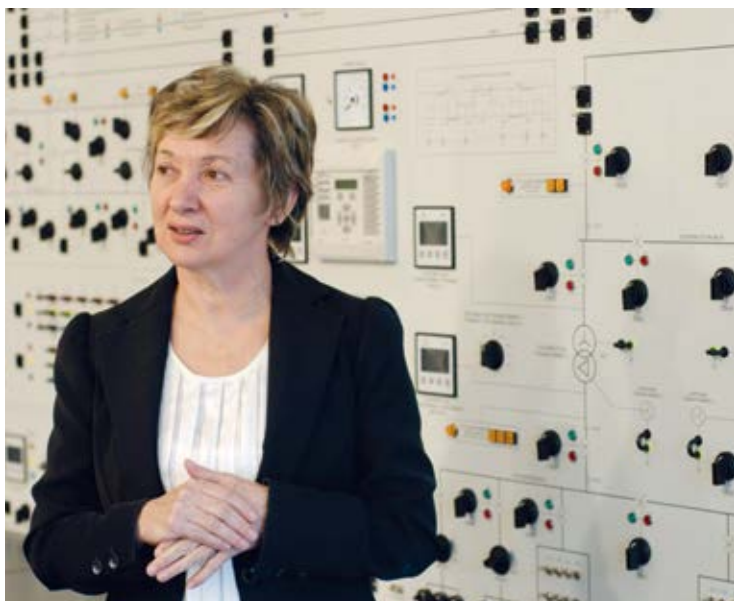
Our Master of Professional Engineering is accredited by Engineers Australia, the national engineering accreditation body. This enables you to practise as an engineer in Australia and around the world.



“The electricity industry is poised for a revolution and my research into intelligent energy networks is supporting this change. I work with energy providers from around the world, helping them to develop smart grid technology. A smart grid can detect and react to changes in power usage. It is the cornerstone of more robust, flexible and efficient power networks. The work will enable us to meet the power demands of this and future generations.”

Professor Joe Dong
Head of School of Electrical and Information Engineering





“I was delighted to be recognised for my contribution to furthering education, science and technology in China. It is the highest award issued by the Chinese government to foreign experts and I am truly honoured to receive it.”

Professor Branka Vucetic
Wireless communications expert and recipient of a Chinese Government Friendship Award

International partnerships

We are committed to international teaching, research and industry collaborations. We encourage our students, researchers and staff to engage in collaboration that deepens their knowledge and broaden their global outlook. The faculty has developed partnerships with key international institutions, including a landmark biomedical engineering alliance with Shanghai Jiao Tong University in China.



“I am undertaking research into advanced control systems for robotic spacecraft at Texas A&M University, working with researchers at the Land Air and Space Robotics (LASR) Laboratory and the Massachusetts Institute of Technology (MIT) – and later, with the NASA Johnson Space Center.”

Ben Morrell
PhD candidate

Innovative learning environment

Our labs, teaching spaces and learning hubs are designed to help you get the most out of your learning experience. They incorporate the latest technology and equipment and allow interactive study, research and collaboration.

Our leading facilities include:

- the Australian Centre for Field Robotics, one of the world’s leading robotics research institutes, instrumental in developing breakthrough technologies in field robotics principles and systems
- our Institute of Biomedical Engineering and Technology, which undertakes pioneering research with major national and international organisations in the areas of image processing and data management, image visualisation and analysis, bioinformatics and data mining, medical devices and networking, biomaterials and regenerative tissue engineering
- the Computing and Audio Research Laboratory which, in collaboration with the Auditory Neuroscience Laboratory and the Acoustics Research Laboratory, is one of the three largest spatial audio research groups in the world
- our Centre for Advanced Structural Engineering, which houses one of the largest structural engineering laboratories in the southern hemisphere.



Scholarships

We offer various scholarships and other forms of financial assistance to help you achieve your personal and professional goals, including:

Dr Abdul Kalam International Scholarships

A former president of India, Dr Kalam established these merit-based scholarships for international students commencing a master’s program in the faculty.

Sydney Achievers Scholarships

This flagship scholarship program for international students rewards students with outstanding academic results. Each scholarship is valued at A\$10,000 per year for the length of the degree.

Research scholarships

We offer a number of different research and supplementary scholarships including the Mick Boyle Research Scholarship in Engineering, designed to encourage research and innovation to create sustainable communities and infrastructure.

View all our scholarship opportunities at

- sydney.edu.au/scholarships
- sydney.edu.au/engineering/scholarships

“My research contributes to the development of international standards for steel structures so they can safely withstand weight, wind, and movement such as earthquakes. This research drives my approach to teaching structural design and analysis.”

Professor Kim Rasmussen

Associate Dean (Research and Research Training) and Chairman, Centre for Advanced Structural Engineering



Our programs

Coursework

The Faculty of Engineering and Information Technologies offers two engineering postgraduate coursework programs:

- Master of Engineering (page 8)
- Master of Professional Engineering (page 10).

If you want to take the next step in your career or develop academic expertise in your chosen field, master's degrees are ideal. They typically require between one and two years of full-time study.

Graduate diplomas are normally based on master's programs but don't take as long to complete. They are a good option if you can't commit to a full master's degree, and typically require one year of full-time study.

Graduate certificates are a good choice if you want to complete a short academic training course to further your career, or sample postgraduate study. They typically require six months of full-time study.

You can usually transfer from either a graduate certificate or graduate diploma into a master's qualification. In this way these degrees can act as a pathway if you don't meet the master's entry requirements. Search our website to find out the specific study mode offered for your course:

- sydney.edu.au/courses

Research

We offer two postgraduate research programs in engineering (see page 12):

- Master of Philosophy (MPhil)
- Doctor of Philosophy (PhD).

Recognition of prior learning (RPL) and credit

Depending on your previous studies or work experience, you may be able to apply for recognition of prior learning or credit that will reduce the total credit points or time needed to complete your course.

Credit for previous studies

You may be eligible for credit if your previous studies are assessed as being directly equivalent to our units of study. Credit arrangements vary by course.

Fast track your postgraduate studies

For some courses, your previous studies or relevant professional experience may make you eligible for a reduced volume of learning (RVL) to achieve the learning outcomes of the course. This could reduce the duration and unit of study requirements by one to two semesters. Reductions and eligibility requirements vary.

How do I apply for credit or RPL?

You need to apply when completing your online course application. To find out more about course-specific requirements, visit your faculty website. For more information on credit, visit

- sydney.edu.au/study/credit

Choosing a coursework degree

Unsure of the right postgraduate coursework degree for you? Take a look at these student case studies to help with your decision.

Case study 1

Aisha has a bachelor's degree in science from an overseas university and wants to complete a master's degree. She is looking to enhance her existing qualifications and specialise in software engineering in order to work around the world as an engineer.

Solution

The Master of Professional Engineering will give Aisha both practical engineering practice and research skills in software engineering that she needs to be recognised as an Australian graduate engineer.

Case study 2

Lucy has a bachelor's degree in civil engineering from an Australian university and is aiming to further her technical expertise in structural engineering as she progresses through to management in a large civil engineering firm.

Solution

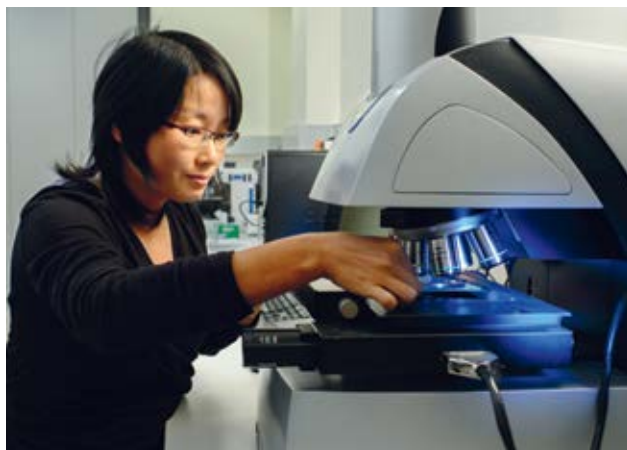
The Master of Engineering will allow Lucy to build on her engineering expertise as well as develop professional and management skills which she can apply in the workplace in order to advance her career.

Case study 3

Jin has studied environmental science and holds a bachelor's degree from a Chinese university. He wants to work in environmental engineering and is looking for an appropriate postgraduate degree option.

Solution

Studying a Master of Professional Engineering, specialising in either chemical and biomolecular engineering or fluids engineering, will provide Jin with the recognised qualifications to practise as an environmental engineer.



These case studies are an example only. When making your decision, you need to take into consideration your individual circumstances and eligibility for courses.

Still unsure?

Discuss your situation with our helpful advisers.

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Master of Engineering

The Master of Engineering is a specialised program for qualified engineers seeking to move into a management role.

This program is designed to help qualified engineers strengthen their management capability and technical expertise. Qualified engineers looking to specialise or update their skills could also consider this program.

The Master of Engineering allows you to build on your existing engineering undergraduate degree by developing specialised technical knowledge in one of 14 engineering majors:

- automation and manufacturing systems engineering
- biomedical engineering
- chemical and biomolecular engineering
- civil engineering
- electrical engineering
- fluids engineering
- geomechanical engineering
- mechanical engineering
- power engineering
- risk management
- software engineering
- structural engineering
- sustainability and environmental engineering
- telecommunications engineering.

Course duration

1.5 years full time (3 semesters)

Depending on the level and type of your prior studies, you may be eligible for recognition of prior learning that can reduce the length of your degree.

Course structure

This program comprises core units of study along with electives to broaden your knowledge. You will complete a sequence of specialist units that comprises a major in your chosen field. This course has a strong focus on project work to enhance self-directed learning.

Professional engineering management subjects enhance your leadership and commercial capabilities. They include:

- sustainable design, engineering and management
- entrepreneurship for engineers
- project process planning and control
- safety systems and risk management.

Research pathways are available within all majors, allowing you to complete a research project as preparation for a research degree.

Year 1, Semester 1	Specialisation conversion units*
Year 1, Semester 2	Research project Specialisation units Electives
Year 2, Semester 1	Research project Specialisation units Electives

*Available as recognised prior learning

Admission requirements

To apply for this degree, you need to have a recognised Bachelor of Engineering degree in the same or a similar field of study to the major for which you are applying, with at least a credit average.

Alternatively, you need to hold a Graduate Diploma in Engineering from the University of Sydney, with at least a credit average.

If you don't meet these criteria, you may be considered for entry into the Graduate Diploma in Engineering. If you achieve a credit average in the first semester, you can apply to transfer into the Master of Engineering.

More information

For detailed information on each specialisation, including units of study, see

– sydney.edu.au/courses



Master of Professional Engineering

The Master of Professional Engineering will provide you with a solid foundation for a career in engineering and a qualification that is in high demand around the world.

If you would like to change careers and become an engineer, obtain accredited qualifications that will enable you to practise in Australia and overseas, or simply move into a different field of engineering, you might like to consider this master's program.

It will provide you with the engineering professional practice and research skills that lead to recognition as an Australian graduate engineer. Your qualifications will be recognised internationally through the Washington Accord of the International Engineering Alliance.

This degree will also help you develop the sound communication, management and decision-making capabilities necessary to interpret and discuss complex issues in your area of specialisation.

Specialisations

Fully accredited by Engineers Australia, the national accreditation body:

- biomedical engineering
- chemical and biomolecular engineering
- civil engineering
- electrical engineering
- mechanical engineering
- power engineering
- structural engineering
- telecommunications engineering.

Provisionally accredited by Engineers Australia, the national accreditation body:

- aerospace engineering
- fluids engineering
- geomechanical engineering
- software engineering.

Course duration

3 years full-time (6 semesters)

Depending on the level and type of your previous tertiary studies, you may be eligible for recognition of prior learning that can reduce the length of your degree.

Effect of recognition of prior learning on course duration

Existing qualification	Recognition of prior learning	Adjusted duration (years)
Bachelor of Science or equivalent	up to 24 credit points	2.5-3
Bachelor of Engineering in unrelated field	up to 24 credit points	2.5
Bachelor of Engineering in related field	up to 48 credit points	2

This table is indicative only. Eligibility for recognition of prior learning will be assessed on a case-by-case basis.



Course structure

This program comprises foundation units, elective units in the area of your specialisation and a 12-week practical industry experience component. You can also choose from several professional electives and complete a capstone project in your final year.

Year 1, Semester 1	Foundation units*
Year 1, Semester 2	Foundation units*
Year 2, Semester 1	Specialisation conversion units
Year 2, Semester 2	Specialisation conversion units Electives
	Practical experience
Year 3, Semester 1	Research project Specialisation units Electives
Year 3, Semester 2	Research project Specialisation units Electives

*Available as recognised prior learning

Admission requirements

You need to have a recognised bachelor's degree in engineering, science or applied science with at least an honours, honours equivalent or credit average, and sufficient tertiary knowledge of mathematics and science-based units, depending on your chosen specialisation.

More information

For detailed information on each specialisation, including units of study, see

– sydney.edu.au/courses



“The undergraduate degree I studied in India focused on science. I wanted to build a stronger foundation in chemical engineering and become a professional engineer. Choosing the Master of Professional Engineering is one of the best decisions I’ve made. I’m now working as a risk and safety engineer in Sydney.”

Michell Liu
Master of Professional Engineering



“Studying professional engineering at Sydney changed my life – the flexible program made it easy for me to move into biomedical engineering. I have gone on to complete a PhD and founded my own biotech start-up.”

Ali Fathi
Master of Professional Engineering
and PhD

Research programs

We invest in research that changes the way we think about the world and how we live and work in it.

The University is a member of Australia's prestigious Group of Eight network and the Association of Pacific Rim Universities. This association partners us with others that excel in research, including Stanford, Caltech, UC Berkeley and UCLA.



Our research is shaped by the big picture. We look at real-world problems from all angles, combining the expertise and talents of scholars from many disciplines. This collaboration drives our interdisciplinary research centres. Find out more about our current research online:

- sydney.edu.au/research

Our research degrees

Embarking on a research degree at Sydney is an opportunity to work alongside some of the world's brightest and most accomplished academics.

We offer exceptional facilities and we have an innovative edge and the drive to challenge traditional ways of thinking. You will have the support to contribute to research that makes a meaningful, real-world impact. Learn more about our research degrees:

- sydney.edu.au/study/find-a-course/postgraduate-research.html

The Faculty of Engineering and Information Technologies focuses on several research themes including:

- field robotics
- agricultural engineering
- biomedical engineering and technologies
- human-centred technology
- complex systems

- materials and structures
- food processing
- data science
- clean, intelligent energy networks
- water and the environment.

We offer you the opportunity to pursue research through a Master of Philosophy or a Doctor of Philosophy.

Master of Philosophy (MPhil)

Duration: 2 years

The MPhil program involves preparing a thesis considered to make an original contribution to the subject concerned. Applicants need to have a bachelor's degree with first or second-class honours or an equivalent qualification from an accredited institution. Candidates who achieve an outstanding performance may be eligible to upgrade to the Doctor of Philosophy.

Doctor of Philosophy (PhD)

Duration: 3 years

The PhD program involves preparing a thesis considered to make a substantial and original contribution to the subject concerned. Applicants need to have a master's degree by research or a bachelor's degree with first or second-class honours (or equivalent) from a recognised institution.



Supporting our researchers

At the faculty, we support our researchers to excel in their chosen field in various ways, from providing strategic advice on research opportunities to assisting you to access funding. We also help you to develop transferable skills in research leadership and management, commercialisation, communication and cross-disciplinary capabilities.



Inside view

William Reid
Bachelor of Engineering (Mechatronics)
Bachelor of Computer Science

William Reid (pictured below left) came to the University of Sydney after completing a Bachelor of Engineering (Mechatronics) and a Bachelor of Computer Science. His interest in space exploration, robotics and science and engineering education inspired him to pursue a PhD in this field.

William's research involves the development of a space exploration robot to be used for both high school science education and university-level research.

Working in the University's Australian Centre for Field Robotics, William's current focus is on improving the agility of the wheel-on-leg platforms used on robotic devices like the MAMMOTH rover (pictured). This work saw him take out the prestigious international Mathworks Simulink Student Challenge in 2015.

"I have been investigating ways to efficiently control robots like the MAMMOTH rover as well as planning routes for them," William says. "The ongoing research goal is to ensure high traversability and safe and efficient operations for such a vehicle on rough terrain."

William's research could help the MAMMOTH and other rovers overcome various challenges they could face on a different planet. "Through my PhD I have had the opportunity to meet space roboticists from around the world. I feel like I now know the community and can become an active contributor to it."

How to apply

Coursework

If you are a domestic or international applicant, we invite you to apply online for postgraduate study by coursework, by following these steps:

Step 1

Search for the course you are interested in at:

- sydney.edu.au/courses

Step 2

Select the program of study you wish to apply for and check that you meet the admission requirements.

Step 3

Click the ‘apply now’ button to proceed with your application. You can also apply for recognition of prior learning which, if approved, can significantly reduce the length of your degree.

Research

If you would like to apply for a research degree, we ask you to follow these steps:

Step 1: Find an academic supervisor

Our Research Supervisor Connect online portal lists all the University research opportunities currently available for new students. Search through research ideas, read about supervisors’ areas of interest and expertise, and make initial contact with them:

- sydney.edu.au/research/opportunities

Step 2: Develop a research proposal

Once you have spoken with an academic, you will need to develop and submit an initial research proposal. The supervisor will read and comment on your proposal, and indicate if they are willing to supervise you before you submit your application. You can find more information about developing a proposal under ‘how to apply’ at:

- sydney.edu.au/research/opportunities

Step 3: Identify academic referees

You will need to provide details of two academic referees who are familiar with your previous academic qualifications and achievements, who can then submit an academic referee report on your behalf. Instructions are provided within your online application form.

Step 4: Submit your application

We invite you to lodge your application online:

- visit sydney.edu.au/courses and search for your program of study
- select the degree for which you wish to apply
- click on the ‘apply’ button to begin the application process.

Need more information?

Domestic students

- sydney.edu.au/ask-domestic
1800 SYD UNI (1800 793 864)

International students

- sydney.edu.au/ask-international
+61 2 8627 1444 (outside Australia)



Courses at a glance

Course Name	Duration (years)	Credit points	Mode of delivery			
			full time	part time	block mode	flexible
Complex Systems						
Graduate Diploma in Complex Systems	1	48	✓	✓	-	-
Master of Complex Systems	2	96	✓	✓	-	-
Computing						
Graduate Diploma in Computing	1.5	60	✓	✓	-	-
Information Technology						
Graduate Certificate in Information Technology	0.5	24	✓	✓	-	-
Graduate Diploma in Information Technology	1	48	✓	✓	-	-
Master of Information Technology	1.5	72	✓	✓	-	-
Information Technology Management						
Graduate Certificate in Information Technology Management	0.5	24	✓	✓	-	-
Graduate Diploma in Information Technology Management	1	48	✓	✓	-	-
Master of Information Technology Management	1.5	72	✓	✓	-	-
Master of Information Technology / Master of Information Technology Management	2	96	✓	✓	-	-
Data Science						
Graduate Certificate in Data Science	0.5	24	✓	✓	-	-
Master of Data Science	1	48	✓	✓	-	-
Health Technology Innovation						
Graduate Diploma in Health Technology Innovation	1.5	60	✓	✓	✓	✓
Master of Health Technology Innovation	2	96	✓	✓	✓	✓
Engineering						
Graduate Certificate in Engineering	0.5	24	✓	✓	-	-
Graduate Diploma in Engineering	1	36	✓	✓	-	-
Master of Engineering	1.5	72	✓	✓	-	-
Professional Engineering						
Master of Professional Engineering	2-3	144	✓	✓	-	-
Project Management						
Graduate Certificate in Project Management	0.5	24	✓	✓	✓	✓
Graduate Diploma in Project Management	1	48	✓	✓	✓	✓
Master of Project Management	1.5	72	✓	✓	✓	✓
Project Leadership						
Graduate Certificate in Project Leadership	0.5	24	✓	✓	✓	✓
Graduate Diploma in Project Leadership	1	36	✓	✓	✓	✓
Master of Project Leadership	1	48	✓	✓	✓	✓
Research						
Master of Philosophy	Min. 2	N/A	✓	✓	-	-
Doctor of Philosophy	Min. 3	N/A	✓	✓	-	-

Note: All courses have a mid-year intake.

Please refer to sydney.edu.au/courses for up-to-date course information.

Fees and costs

Domestic students

Most domestic postgraduate students study in a fee-paying place, however, a limited number of Commonwealth supported places (CSPs) may be available for some courses, on a competitive basis. Refer to your chosen course in sydney.edu.au/courses to determine if it offers CSPs.

The tuition fees and, where applicable, student contributions on sydney.edu.au/courses are an estimate only of the fees payable in the advertised calendar year of study. Fees are based on a full-time student enrolment load of 24 credit points per semester, or 48 credit points per year (1.0 EFTSL). If your study load for the year is more or less than 1.0 EFTSL your tuition fee or student contribution amount will differ. Exact student contribution amounts for your course will depend on the specific units of study in which you enrol.

The Australian Government administers the Higher Education Loan Programme (HELP) to assist students with the cost of their fees. To find out if you are eligible to access HELP, visit www.studyassist.gov.au

Research Training Scheme (RTS)

Domestic students undertaking a higher degree by research are covered by the Research Training Scheme (RTS) and are exempt from the payment of tuition fees, but only up to the government-specified maximum for the course. For more information on RTS, visit sydney.edu.au/rts

International students

The tuition fees on sydney.edu.au/courses are an estimate only of the fees payable in the advertised calendar year of study. Fees are based on a full-time student enrolment load of 24 credit points per semester, or 48 credit points per year (1.0 EFTSL). If your study load for the year is more or less than 1.0 EFTSL your tuition fee will differ.

Annual review

The University's tuition fees for domestic and international postgraduate students are subject to annual review, and will increase each year of your period of study, effective at the start of each calendar year.

Student contribution amounts are also reviewed annually by the University, and will increase each year of your period of study (subject to a maximum student contribution amount determined by the Australian Government), effective at the start of each calendar year. For more information, visit www.studyassist.gov.au

Other costs

In addition to fees, you should budget for:

- additional course costs. Some costs are significant for faculty-specific materials and textbooks, tools, protective clothing, and equipment. For more information about additional costs, visit your faculty's website at sydney.edu.au/faculties
- the Student Services and Amenities (SSA) fee.

The following costs are specific to international students:

- health insurance through the Overseas Student Health Cover (OSHC) scheme. This is an Australian Government requirement for student visa holders: sydney.edu.au/pg-int-health
- education expenses for students' children: schools.nsw.edu.au/international
- living expenses such as food and rent: sydney.edu.au/study/finances-fees-costs/living-costs.html

More information

For more information about course-related and other incidental costs, financial assistance, loans, and the availability of scholarships, please visit: sydney.edu.au/study/finances-fees-costs.html

If you have other specific questions about fees or need more information, please get in touch with us: sydney.edu.au/contact-us

Method of payment

There are several ways you can pay the fees that apply to your study. Please note that a surcharge of 0.8 percent will apply for payments made by Visa or MasterCard. The surcharge is subject to review and may change. Information about payment methods and the surcharge is set out at: sydney.edu.au/study/finances-fees-costs/fees-and-loans/paying-your-fees.html

Important dates

Postgraduate Information Evening

18 May 2016

Semester 2, 2016 applications close

30 June 2016*

Open Day

27 August 2016

Postgraduate Information Evening

12 October 2016

Semester 1, 2017 applications close

31 January 2017*

To find out about other important
University dates, please visit

– sydney.edu.au/dates

*Some exceptions apply. Please search for your
course online to check exact closing dates.

This guide provides the key information you need to apply for a postgraduate degree in engineering, but the next step is up to you.

To learn more, come and see us on Open Day, attend one of our postgraduate information sessions, call our helpline or visit our website.

sydney.edu.au/postgraduate
sydney.edu.au/engineering

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