



EDITH COWAN UNIVERSITY

# MASTER OF ENGINEERING



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Edith Cowan University is Western Australia's second largest university, with a diverse mix of local, interstate and international students. At ECU, we recognise people with passion and potential, offering the right balance of practical knowledge and academic excellence. If you're looking for a learning environment that is supportive, flexible and relevant to the real world – then you've come to the right place.

Our courses have a strong focus on providing real life solutions. Practical projects, industry placements, and a commitment to excellence in teaching and research are key features of our programs. With a range of career focussed areas of study, developed in consultation with the professions, ECU's courses are breaking new ground and leading the sector.

## ECU SCHOOL OF ENGINEERING



The School of Engineering is a modern and vibrant school with world class facilities to support quality teaching and learning and cutting edge research in a variety of high technology fields. Engineering was first established at ECU in 1992, and is currently one of the University's most successful and fastest expanding areas.

The School of Engineering is committed to pursuing excellence in all of its endeavours, with a strong focus on teaching and learning and well equipped facilities to support its activities. We aim to provide students with relevant courses of the highest standard in a friendly and supportive environment, where a strong industry focus enriches the teaching and learning outcomes.

At ECU we believe that learning should be interesting and enjoyable and that theory is important, but should always be reinforced with laboratory work and practical examples. The School has state-of-the-art equipped teaching laboratories to support all the areas of specialisation offered including mechanical science, materials, manufacturing, robotics, electrical power, control, electronics, thermodynamics, communications, structures, concrete, soil mechanics and hydraulics. In all of our laboratories there is an emphasis on the use of industry standard hardware and software so that our graduates' knowledge and skills are aligned with industry needs and current professional practice.

The School of Engineering is located on the modern and spacious Joondalup campus, which offers a harmonious teaching and learning environment and a lifestyle ideal for productive study. Access to the campus is made easy by the close proximity to the freeway and regular shuttle buses from the Joondalup train and bus stations.

The staff of the School are actively involved in research that allows them to stay in the forefront of their chosen discipline specialisations.

### What will I learn in a Master of Engineering degree?

The Master of Engineering at ECU will build on your knowledge of mathematics, physics, computing and the engineering sciences to achieve a professionally accredited Engineering degree. You would already have completed studies in another degree or at another university and now wish to become a Professional Engineer. You will learn how to build on your existing knowledge and apply it in a practical way to create innovative and effective designs that solve the problems of today, and of the future.

In all of our courses there is a strong emphasis on working in teams and solving real-world problems because we know how important these skills are to industry. In order for you to do this it is very important that you can effectively communicate and engage with the many disciplines that collaborate on major engineering projects. Through rigorous coverage of theoretical foundations, and practical project work in a diverse range of engineering subject areas, our engineering courses will provide you with these valuable skills.

You can also be assured that, due to our strong industry ties, the engineering courses at ECU are always up-to-date and maintain the highest level of relevance to the requirements of industry and the job market. You will finish your studies at ECU with the confidence that you are graduating with an engineering degree that will be fully accredited by Engineers Australia as meeting the breadth and depth of training required of a Professional Engineer.



“We provide a high quality and innovative learning environment which treats the scientific foundations with rigour, develops knowledge and skills relevant to professional engineering practice, and promotes social values and environmental responsibility.”

Professor Daryoush Habibi, Head of School, School of Engineering, Edith Cowan University



# MASTER OF ENGINEERING

(COURSE CRICOS CODE: 067370J)

The Master of Engineering is a two year (full-time equivalent) course intended to provide graduates with a professional Engineering degree. The course is aimed at graduates who would like to upgrade their qualifications to become recognised as Professional Engineers. The course is suitable for people who already have a relevant degree in science or technology and who would like to upgrade to a professional qualification in Engineering or those with engineering qualifications who would like to change their discipline of specialisation. The course would also ideal for international students, who may already hold an engineering degree and are seeking an accredited Professional Engineering award that may be completed in two years.

<b>Duration</b>	2 years
<b>Availability</b>	On-campus, Full-time, Part-time
<b>Campus</b>	Joondalup

The two year Master of Engineering (MEng) course is offered in the following engineering discipline areas:

- Civil
- Electrical Power
- Mechanical
- Mechatronics
- Instrumentation, Control & Automation
- Electronics & Communications
- Computer Systems

The MEng is primarily a course-work program of study, but does include a major design project in the second year.

## CIVIL ENGINEERING

In the two year Masters in Engineering (Civil) course at ECU you will extend your fundamental knowledge of the physical and engineering sciences along with the principles of computer aided design, engineering materials, and engineering mechanics. You will study the areas of structural analysis and design, steel and concrete design, surveying, road design and construction and water supply engineering; all supported by extensive laboratory, practical and project work. You will also acquire knowledge and skills in construction technology, site management and project management, ensuring that you are ready for the challenges you will face as a practicing engineer.

Civil engineers are in great demand all over the world and whether your aspirations are to build bridges or skyscrapers, harbours or airports, reservoirs or wind farms, the range of career opportunities open to you will be plentiful.

## ELECTRICAL POWER ENGINEERING

This course will build on your existing foundation knowledge in the fundamental sciences which will have included a grounding in general electrical and electronic circuits and systems, and engineering mechanics. The course will develop extensive skills, supported by state-of-the-art laboratory facilities, in power system analysis and design, power electronics, electrical machines and transformers, industrial automation, and sustainability and renewable energy. You will gain sound engineering knowledge and specialist skills that will be very attractive to employers in all areas where electrical power is crucial, including energy utilities, mining, oil and gas, manufacturing, etc. Whatever your interests, your opportunities will be limited only by your imagination.



## MECHANICAL ENGINEERING

The two year Masters in Engineering (Mechanical) course at ECU will extend your fundamental knowledge in the physical and engineering sciences along with mechanics and computer aided design. The course will include studies in computer aided manufacturing, advanced engineering materials, thermodynamics, mechanical design, fluid mechanics, control systems, heating and cooling systems, and project management. It will equip you for today's engineering profession whilst you experience a mix of hands on learning and personal skills development.

The diverse experience of our staff in Mechanical Engineering in combination with our well equipped laboratories will place you at the forefront of this field both locally and internationally.

Mechanical engineering skills are highly sought after in a wide range of industries in such areas as manufacturing, mining, oil and gas, water resources, building services, automotive, and many more.

## MECHATRONICS ENGINEERING

With this innovative two year Masters in Engineering (Mechatronics) course at ECU you will build on your fundamental competencies in areas like mathematics, physics, engineering mechanics and materials science. It will extend your knowledge in areas such as computer aided design, computer aided manufacturing, electromechanical systems, advanced materials, sensor technology, automatic control, and robotics. In addition, you will get extensive hands-on experience designing mechanical, electronic and electromechanical systems through the significant laboratory and project work components of the course.

You will have employment opportunities in most sectors including manufacturing, mining and resources, defence, aerospace, and consulting.

## INSTRUMENTATION, CONTROL & AUTOMATION ENGINEERING

The two year Masters in Engineering (Instrumentation, Control & Automation) will build on your current knowledge of mathematics, physics and electronics. Most modern systems are controlled by microprocessors or embedded controllers, thus you will learn about computer control and embedded systems as well as communications and networking. Beyond this technical expertise, you will gain invaluable problem solving skills, an appreciation of environmental concerns and the capacity to work effectively in multidisciplinary teams.

Nearly all the resource projects require engineers with the kinds of skills you will learn in this course. You might be interested in working in the oil and gas industry, the mining industry, as a product designer in a development company, as a consultant, or in any number of other exciting positions worldwide.



## ELECTRONICS & COMMUNICATIONS ENGINEERING

This course will build on your existing fundamental knowledge in physics and mathematics required to analyse and understand electronic circuits. You will engage in extensive laboratory work, giving you practical experience of system design and making your learning both interesting and relevant. The two year Master in Engineering (Electronics & Communications) includes the design of electronic circuits and systems, communication systems including mobile and stationary communication, cellular telephony, and analogue and digital modulation and transmission systems.

You can be confident that you will have the training of a Professional Engineer with an excellent knowledge of electronics and communications, giving you a wide range of career choices.

## COMPUTER SYSTEMS ENGINEERING

This two year Masters in Engineering (Computer Systems) will build on your current knowledge in physics and mathematics as well as electronic circuits and systems. You will also learn about communication systems and signal processing, but in particular you will learn how to design and build computer systems. You will learn how computers operate and how they can be interfaced to other electronic equipment. You will learn the programming skills required to manage real time systems and to make the systems fault tolerant, something that is particularly important if your computer is flying an airliner or controlling a hazardous process. As a computer engineer you will often work with other specialist engineers, so there is a special emphasis on teamwork in this course. Computers are used widely in almost every industry so there are many opportunities you could pursue for an interesting career in a wide variety of areas.



## Admission Requirements

Applicants to this degree must have completed a Bachelor degree, or equivalent, in a related science, technology or engineering field. You must be able to demonstrate through your prior studies, or through work experience, that you have achieved basic competencies in most of the following areas:

- Mathematics: including differential and integral calculus and linear algebra
- Physical Sciences: including statics, dynamics and mechanics, properties of materials, electricity and basic electronics
- Computing: including the use of software packages and programming.
- Engineering drawing and computer aided design

The specific requirements will depend on the chosen specialisation for the Masters degree.

Where an applicant does not meet all these pre-requisites, additional bridging units may be required as determined by the Course Coordinator. As a result the length of the Course may be extended by one or two semesters.

For more information, please contact the Engineering Course Co-ordinator.

## Course Structure

The course requires two years of full time study and includes a major design project taken in the second year. To complete the course the Engineering Practicum unit must also be undertaken. This requires the student to complete a period of 12 weeks full time employment under the supervision of an engineer in an approved work situation. The Engineering Practicum can be undertaken during the break between the first and second years of the course, or at the conclusion of the second year.

Students who already have approved work experience under the supervision of a Professional Engineer where they have demonstrated work performance at least equivalent to a student engineer in the area of their chosen discipline may be exempt from this requirement.

## Careers

Career-focussed areas of study, developed in consultation with the professions would make this qualification quite sought after in the engineering sector. With the diverse range of disciplines offered and the continuous engagement with industry for the delivery of this course, the career opportunities are many and impressive. Engineering was recognised as one of the most 'in demand' discipline groups in 2008 according to the Graduate Outlook Survey performed by the Graduates Careers Australia.

Engineers are highly sought after, and very well paid, professionals. It is expected that the long term demand for engineering graduates will remain strong despite recent economic cycles.

Your Master of Engineering degree from ECU will provide you with the necessary accreditation to become a Professional Engineer and re-shape your career prospects in your chosen discipline specialisation.



## GREENING ECU

Edith Cowan University is committed to reducing the environmental impact associated with its operations by conducting its activities in a socially and environmentally responsible manner.

This includes implementing strategies and technologies that minimise waste of resources and demonstrate environmentally sensitive development, innovation and continuous improvement.

This brochure is printed on paper stock that is both chlorine free and made from pulp sourced from plantation grown timber. The paper manufacturer is certified to ISO 14001, the internationally recognised standard for environmental management.

## CONTACT US

Contact ECU by phone on **134 ECU (134 328)**

For calls outside Australia phone **(61 8) 6304 0000**

For calls regarding South West region phone **(61 8) 9780 7777**

Email us at: **futurestudy@ecu.edu.au**

For international student enquiries, please phone **(61 3) 8676 7039** or email **international@ecu.edu.au**

Want more specific course information?  
Visit **engineering.ecu.edu.au**

Or why not drop by in person to any of our Student Recruitment and Careers Offices located on each of the following campuses:

Joondalup Campus – Building 18  
270 Joondalup Drive  
Joondalup WA 6027

Mount Lawley Campus – Building 3  
2 Bradford Street  
Mt Lawley WA 6050

South West Campus – Building 1  
585 Robertson Drive  
Bunbury WA 6230