2018 POSTGRADUATE Engineering

Cloud Campus | Geelong | Melbourne | Warrnambool

Electrical and renewable energy engineering
Electromaterials
Electronics engineering
Engineering management
Mechanical engineering design
Research
Develop the engineering expertise to design the infrastructure of our modern world, from roads and power generation to complex mechanical systems. Get a competitive edge at Deakin by tackling real-world engineering problems in collaborative projects with industry partners and through work placements.

Engineering at Deakin

What can I study?
Courses
Research
Contact us

Deakin Hallmarks are awarded as digital credentials that can be shared through professional social platforms such as LinkedIn. They recognise students’ outstanding achievement, at course level, of capabilities that are key to employment success.

World-class facilities
Engineering students at Deakin access world-class facilities located within the Centre for Advanced Design in Engineering Training (CADET) and the Institute for Frontier Materials (IFM). Having access to some of the best facilities in the Australian sector allows students to realise and validate their designs through combinations of computer simulation, prototyping, testing and manufacturing. The teaching-focused approach in CADET ensures that students have extensive access to state-of-the-art equipment, enabling them to gain practical experience and a deeper understanding of their use.

Key facilities/laboratories
- Virtual reality
- 3D printing/additive manufacturing
- Materials and manufacturing
- Renewable energy
- High voltage
- Geomechanical
- Concrete and structural testing
- Water

CADET is a partnership between Deakin University and the Australian Government.

Find out more at deakin.edu.au/engineering/cadet.

Geelong Technology Precinct
The Geelong Technology Precinct provides a unique resource and facility for research aimed at industry cooperation and research application. The precinct is home to the Institute for Frontier Materials (IFM), Institute for Intelligent Systems Research and Innovation (IISRI), CSIRO Materials Science and Engineering, and the Australian Future Fibre Research and Innovation Centre. The Metabolic Research Unit (MRU) and several industry tenants are also located within the precinct. Bringing together industry expertise, state-of-the-art equipment and some of the brightest minds in research, the technology precinct is a rich resource for our students to tap into.

Innovative course design
Innovation is at the heart of great engineering, with design playing a central role. Deakin’s CADET provides some of the best future-focused engineering and design facilities, and a curriculum framework configured around ‘design-based learning’ and industry collaboration, enabling our graduates to become as visionary and forward thinking as CADET itself.
Engineering at Deakin

Industry engagement
Our postgraduate engineering programs offer a number of work placement opportunities so you graduate fully equipped with advanced engineering skills and capable of starting work on projects immediately. Industry partnerships play a significant role in our direction through genuine engagement with organisations such as Shell, ISCAR, AusNet Services, Ford, Barwon Water, VicRoads, Quiksilver, Hazelden's, CSIRO, HeiQ and many others, enabling us to develop industry-ready graduates who are in high demand. Work placements, industry projects and collaboration with industry experts all culminate in a career-shaping learning experience.

A Postgraduate Engineering Internship unit is available to selected students, providing up to 160 hours or 12 weeks of mentored, hands-on learning in industry. Students accepted into the program have completed internships with a range of organisations – from seedling producer to carbon fibre research – undertaking a variety of activities.

Find out more at deakin.edu.au/sebe/enhance-study/work-integrated-learning/school-placements.

A practical focus
Develop technical skills, a positive approach to problem-solving and the ability to work as part of a team. Your course will focus on practical experience and a supervised research or industry project, providing you with the advanced project management skills required to tackle complex, industry-focused problems head on.

‘Our postgraduate engineering courses are innovative, unique and designed to build on our students’ understanding of the principles required to secure a successful engineering career within Australia and globally.’

Associate Professor Arun Patil
Course Director, School of Engineering

Top ranking university
Deakin is ranked #3 in Australia for graduate employability by the prestigious Times Higher Education index. Deakin was recently ranked Victoria’s #1 university under 50 years old by Times Higher Education (2016 and 2017). And as a result of our renowned quality of research and teaching, all three international university rankings put us in the top 2% of the world’s universities.

Data sources: Quacquarelli Symonds (QS); Academic Ranking of World Universities (ARWU); Times Higher Education and QS World University Rankings.

Highly sought-after graduates
The majority of engineers today are baby boomers, ready for retirement. This is creating an engineering skills shortage.
As a result, roles in engineering are expected to rise by 429,000, or 17.3%, in the next five years.*

* Australian Government’s Industry Employment Predictions 2015 Report
**Coursework degrees**

Master of Engineering (Professional) | S751

**SPECIALISATIONS:** Electrical and renewable energy engineering | Electronics engineering | Engineering management | Mechanical engineering design

**ADMISSION REQUIREMENTS:** A four-year Bachelor's degree in related discipline (engineering), or membership of Engineers Australia or equivalent professional body.

An exit option is available at the graduate certificate (4 credit points) level.

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Master of Philosophy (Electromaterials)† | FB01

**ADMISSION REQUIREMENTS:** A bachelor's degree or other qualification at a higher AQF level in any discipline.

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Information correct at July 2017. Deakin University reserves the right to alter, amend or delete course offerings and other information listed.

† A unit or subject is usually 1 credit point (CP). Fees quoted are based on an annual full-time study load (8 CP) FT, regardless of your unit selection. If the course duration is more than one year full-time study (1 FT), the annual fee does not represent the full cost of the course. It represents the cost of one year full-time study (8 CP) in 2018. Fee-Paying Place (FPP): 2018 annual course fees for FPPs are shown in the 2018 domestic full fee (8 CP) column. Fees displayed should be used as a guide only and are subject to change. International fees are based on 8 CP in one year full-time study, unless otherwise indicated. If you’re a successful applicant for research degree candidature, and you’re an Australian citizen, permanent resident or New Zealand citizen, you won’t pay any tuition fees. Please visit deakin.edu.au/fees for the most up-to-date information.

‡ Most courses start in Trimester 1 (March to June). This column indicates whether you have the option of commencing your studies in Trimester 2 (July to October) or Trimester 3 (November to February). Not all units are offered in every trimester. Commencement of research degrees is not confined to Deakin’s trimesters.

# Course lengths may vary in response to requirements within the Australian Qualifications Framework (AQF). Applicants should refer to the handbook for the latest information: deakin.edu.au/handbook.

~ IELTS is the International English Language Testing System. The IELTS scores in the table above reflect the minimum overall score required as well as the lowest score allowed for any band (overall score/lowest band score).

†  The Master of Philosophy (Electromaterials) is a joint course with the University of Wollongong. Students are expected to engage in studies at both universities as part of the degree.

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**What can I study?**

For seven consecutive years, Deakin has achieved the highest level of overall student satisfaction among Victorian universities. These great results are from the responses to ‘Overall Satisfaction’ in the Australian Graduate Survey, 2010–2016.

Source: gooduniversities.com.au

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Engineering

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**Gain credit towards your degree**

With Credit for Prior Learning (CPL), your previous study or work experience may make you eligible for credit towards your Deakin degree, reducing the number of units you need to study and allowing you to complete your course earlier and often more affordably. Find out more at deakin.edu.au/courses/credit-for-prior-learning.

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**Virtual reality bringing prehistoric remnants to life**

A virtual reality (VR) and 3D printing project is creating sensory dinosaur encounters. The application of cutting-edge technology is breathing life into dinosaur fossils. Dr Ben Horan, director of Deakin’s CADET VR Lab, and Dr Kai Aniti, industrial design lecturer and researcher in digital heritage interpretation, are working to develop visual and tactile encounters with dinosaurs.

The project illustrates how the use of new technologies can create more dynamic and engaging avenues to promote the sciences, as well as renewed interest in historical artefacts. A particular focus of the study is “how we can use virtual reality and 3D printing to help with providing educational experiences in a museum context,” Dr Horan says.

Dr Horan said the team was working to create the VR experience using a 360-degree video, illustrating both a present-day scene as well as a historical view from the era of the dinosaur.

“When the users put on a VR headset, they will be immediately immersed into a dig site. After a while, a fern-tree forest will appear, together with a 3D model of a Leaellynasaura,” he says.

“We are very excited to not only provide visitors with an immersive VR experience, but also to touch and play with the dinosaur model, which normally isn’t possible.”

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**Join the most satisfied students in Victoria**

Watch the lab in action at deakin.yt/vrlab.
Master of Engineering (Professional)

Study the Master of Engineering (Professional) and you’ll develop technical skills, a positive approach to problem-solving and the ability to work as part of a team, while focusing on practical experience and a supervised research or industry project that provides you with the advanced project management skills required to tackle complex, industry-focused problems head-on.

Develop advanced engineering skills and the forward-thinking, innovative and entrepreneurial skills employers are looking for, while strengthening and extending your understanding of engineering through the pursuit of specialised study in engineering management, mechanical engineering design, electronics engineering or electrical and renewable energy engineering – the choice is yours.

Deakin’s Master of Engineering (Professional) partners with industry to provide you with practical work experience and professional networks prior to graduation.

Course structure

The 16 credit points include eight core units, four elective units (you can choose which ones to study) and four units from a specialisation. You must complete at least one specialisation as part of this course.

Core units
Engineering Entrepreneurship
Engineering Sustainability
Introduction to Work Placement (0 credit points)
Managing and Developing Innovation
Research Methodology
Project Scoping and Planning (2 credit points)
Project Implementation and Evaluation (2 credit points)
Safety Induction Program (0 credit points)

Elective units
Select from a range of elective units, including our Internship Engineering unit offered to high-achieving students that enables you to complete a placement in an engineering-related position typically a 4-6 week or 12 week placement. Alternatively, in some cases you may even be able to choose elective units from a completely different discipline area (subject to meeting unit requirements).

Specialisations

Electrical and renewable energy engineering

Electrical Systems Protection
Energy Efficiency and Demand Management
Renewable Energy Systems
Smart Grid Systems

Electronics engineering
Control Systems Engineering
Embedded Systems
Instrumentation and Process Control
Sensor Networks

Engineering management
Engineering Leadership (2 credit points)
Engineering Project Management (2 credit points)

Mechanical engineering design
Advanced Manufacturing Technology
CAE and Finite Element Analysis
Product Development
Product Development Technologies

Pathway options

Deakin also offers a Graduate Certificate of Engineering (4 credit points) as an alternative exit option for those commencing the Master of Engineering (Professional) who no longer wish to pursue a master’s level qualification.

Specialisation overview

Electrical and renewable energy engineering

Deakin’s electrical and renewable energy engineering specialisation is designed to produce engineers and professionals who can take up leadership roles in the contemporary power system environment. The program is carefully developed in response to industry needs, due to the strong demand in the renewable energy sector worldwide. It provides unique technical, research and practical learning experiences. Industry projects allow you to work closely with engineers in the area of electrical and renewable energy, and our academic staff are internationally recognised experts in the area of electrical and renewable energy.

Electronics engineering

The electronics engineering specialisation allows you to upgrade your skills and specialise in technology areas associated with electronics. The focus is on systems control, sensor networks, instrumentation and process control, and embedded systems.

Graduates can work in a wide range of industries, including:
- communications
- microelectronics
- electronic equipment design and manufacturing
- medical equipment and networks.

deakin.edu.au/study-at-deakin/find-a-course/engineering

Courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course duration in years</th>
<th>Trimester</th>
<th>Cloud Campus</th>
<th>Melbourne Burwood Campus</th>
<th>Geelong Waterfront Campus</th>
<th>Waurnponds Campus</th>
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Whether you are interested in a challenging and rewarding career in research and development, or looking to expand your skills in professional innovation and entrepreneurial thinking, Deakin’s engineering postgraduate degree options are a terrific way to advance your career.

Professor Karen Hapgood
Head of School, School of Engineering

deakin.edu.au/engineering-design
Master of Philosophy (Electromaterials)

The Master of Philosophy (Electromaterials) provides both a pathway to future PhD studies and also training for future jobs in the energy, manufacturing and health arenas. This is your chance to discover new materials and develop smart devices to help solve some of today’s most challenging global problems.

As a student in the world-first Master of Philosophy (Electromaterials) course, your study will be hands-on – discovering new materials, using cutting-edge characterisation techniques and assembling new materials into electrochemical devices for applications in clean energy, health or advanced manufacturing. You’ll be working with leading, world-renowned researchers in electromaterials through the ARC Centre of Excellence for Electromaterials Science.

Deakin University and the University of Wollongong have teamed up to offer this unique opportunity. You’ll choose from a variety of unique research projects – anything from medical bionics to sustainable energy generation, robotic hands to solar water splitting and the next generation of battery designs. In addition, core units will be streamed live between the two campuses, so you get the best of both worlds.

Course structure

The course comprises a total of 16 credit points, including:

Year 1
Two core units, two elective units* and a research project.

Core units
- Electromaterials Fabrication and Application
- Electromaterials Synthesis and Characterisation
- Research Project

Elective unit
An elective unit from a range of subjects, including:
- Advanced Materials Characterisation
- Foundations of Materials Modelling

Year 2
Research project and thesis

* Electives can be taken at either Deakin or University of Wollongong and will be selected in consultation with your supervisor.

‘At Deakin, I am learning all about photovoltaic technology, smart grid systems and future energy demand and management, which are key subjects to the renewable energy sector, which is where I hope to work in the future.’

Pranita Gargurde
Master of Engineering (Professional) student

deakin.edu.au/study-at-deakin/find-a-course/engineering
Deakin provides world-class research opportunities and the best in research training for students. Our research groups in advanced engineering and design, sustainable infrastructure, engineering education, as well as the Institute for Intelligent Systems Research and Innovation (IISRI) and the Institute for Frontier Materials (IFM), help advance industry and give our graduates a competitive edge.

**Research degrees**

<table>
<thead>
<tr>
<th>Course</th>
<th>Fee 2018</th>
<th>IELTS 2018</th>
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<tbody>
<tr>
<td>Master of Engineering</td>
<td>$36,712</td>
<td>6.5/6</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>$36,712</td>
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**Research snapshot**

Deakin’s Centre for Advanced Design in Engineering Training (CADET) houses virtual reality, digital manufacturing and high voltage labs that allow researchers and students to work together on industry-based projects.

Deakin’s Institute for Intelligent Systems Research and Innovation is home to a unique Universal Motion Simulator – the first haptically enabled robot-based motion simulator in the world.

In the field of energy, our researchers are making outstanding progress in developing more efficient energy storage systems.

A team is working with China’s Dongfang Turbine Company to create more efficient composite materials for wind turbines.

Another group is exploring the use of graphene to extract hydrogen from water.

In analytics, an innovative data-mining initiative is currently being introduced across 10 hospital branches in India. This joint project involves using data to identify critical safety issues and improve efficiencies.

Researchers and students are working collaboratively on world-first technology to turn waste plastic into filaments suitable for use in 3D printers to print fully engineered plumbing parts, such as pipe connectors. To add to the sustainability credentials of the project, the team has developed a way to power the printers using solar energy.

This would be the first example of using 3D printing as recycling and renewable technology all in one.

Be it robotics, pioneering research in big data or developing high-tech aerospace-grade carbon fibre composites, our researchers are dedicating their time to solving 21st century problems through cutting-edge, smart technologies.

**Research interests**

The School of Engineering offers research opportunities in the following areas:

- Advanced design and manufacturing
- Biomedical engineering systems
- Engineering education
- Human interaction systems
- Networked sensing and control
- Structural engineering
- Sustainable infrastructure and energy systems
- Sustainable water management
- Virtual reality environments

Institutes associated with the School of Engineering include:

- Institute for Intelligent Systems Research and Innovation (IISRI)
- Institute for Frontier Materials (IFM)
- Deakin Engineering Education Research (DEER)

Engineers can pursue research degrees, PhDs and Masters by Research in the following areas:

- Advanced design and manufacturing
- Biomedical engineering systems
- Engineering education
- Human interaction systems
- Networked sensing and control
- Structural engineering
- Sustainable infrastructure and energy systems
- Sustainable water management
- Virtual reality environments

For more information about research in engineering visit: deakin.edu.au/engineering/research.
‘Students have the ability to travel globally through exchange and study tours; this is something I recommend at any opportunity. Design and product development is heavily rooted in context and the ability to design for other people. The more you understand about the world, the better designer/engineer you will be.’

Paul Collins
Senior lecturer, School of Engineering