ENGINEERING

UOW ENGINEERING COURSES IN
CIVIL / COMPUTER / ELECTRICAL / ENVIRONMENTAL / MATERIALS / MECHANICAL / MECHATRONIC /
MINING / TELECOMMUNICATIONS
WE'RE GOING PLACES
UOW is one of the best modern universities in Australia. We connect over 30,000 students from more than 130 nations to learn and discover. We're young, we're smart and we work hard enough to be ranked in the top 2% of universities in the world. Join us and see how far you can go.

YOU'RE IN CONTROL
Take control of your life like never before at UOW. Choose your degree. Choose a major. Choose elective subjects, and make exactly the study program you want.

THE TIME OF YOUR LIFE
Study where the brightest people take the time to learn your name. You'll be more than a number at UOW, and you'll be taught by world famous educators and researchers. Outside of class, you'll be part of a campus culture defined by fun and friendship.

OUR GRADS GET JOBS
UOW graduates have the skills employers want. We've been rated in the top 100 in the world by employers for nearly a decade. You'll learn how to learn, how to turn theory into practice, and how people with different skills work together.

BE SOMEONE YOU'RE PROUD OF
Challenge yourself and come out on top at UOW. Tackle big ideas in your degree, push yourself and travel the world on international exchange, bring your learning to life with a UOWx program such as mentoring local students.

STUDY AT ONE OF THE WORLD'S BEST UNIVERSITIES

★ 5-STAR RATING FOR GETTING A FULL-TIME JOB

❤ TOP 2% OF UNIVERSITIES IN THE WORLD

🎓 TOP 50 UNIVERSITIES UNDER 50 YEARS OLD

✍️ TOP 100 FOR GLOBAL GRADUATES

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1. Good Universities Guide 2015  
2. QS World University Rankings 2014/2015  
3. QS Top 50 Under 50 Rankings 2014  
4. QS World University Graduate Employers Survey 2014/2015
SIX REASONS TO STUDY ENGINEERING AT UOW

1. SUPPORT TO SUCCEED
As a potential engineer you will have access and support from high quality teaching staff and laboratories. A good engineer can ‘do’ what they know. We teach the fundamentals of technical engineering and give you the time to apply your knowledge in real world situations.

2. WE WILL HELP YOU PREPARE FOR THE REAL WORLD
We will help you with your future career, with projects, teamwork, and the ability to communicate your ideas and put them into practice. You will have the opportunity to participate in creative design projects, study tours and bridge building competitions.

3. CAREER DIVERSITY
Engineers enjoy better career diversity than almost any other profession in the world. It is as much about technical knowledge as it is a mindset: a practical way of learning to understand and develop solutions to technical and social problems. At UOW, we will help you develop, and support your practical learning at every step.

4. LEADERS IN SUSTAINABILITY
When you study with us, you will be studying at the home of the award winning Solar Decathlon House and the Sustainable Buildings Research Centre. You will gain a deep knowledge of the principles and practices of sustainable engineering, and you will graduate with the skills needed to be an engineer for the new millennium.

5. ENGINEERING CAN TAKE YOU ANYWHERE
Engineering is truly an international career where you use your skills to solve problems anywhere in the world. Our degrees are accredited by Engineers Australia, and under the Washington Accord you have a passport to work as an engineer in many other countries including the US, UK, Canada, Japan and Southeast Asia. You will also have the opportunity to travel whilst studying through the Study Abroad program and study tours.

6. GLOBAL REPUTATION
UOW is among the top Australian engineering faculties: our global reputation in teaching and research has earned us a place in the Group of Eight Engineering and Associates. The Australian Research Council ranked our multidisciplinary work as “well above world standard”, and our Civil, Manufacturing, Materials, and Mechanical Engineering research as “above world standard performance”.

Engineers design and create solutions for everyday life, from the large scale to the nano-level. Engineering is life in action: engineers help create clean water, develop reliable sources and storage of food, and find more sustainable energy sources.

They connect communities by designing integrated transport systems to reduce congestion and they even design cost-effective modules for space travel. Here are some reasons why you should consider UOW for your engineering degree.
Bachelor of Engineering (Honours)

ATAR 80 (95 Scholar)
DURATION 4 years (single major)
5 years (double major)
STARTS Autumn (February), Spring (July)
LOCATION Wollongong
UAC Bachelor of Engineering (Honours) (Scholar) 755601
Flexible First Year 755624
Civil Engineering 755611
Computer Engineering 755621
Electrical Engineering 755622
Environmental Engineering 755612
Materials Engineering 755613
Mechanical Engineering 755614
Mechatronic Engineering 755616
Mining Engineering 755615
Telecommunications Engineering 755623

CRICOS Bachelor of Engineering (Honours) (Scholar) – single major 083341C
Bachelor of Engineering (Honours) (Scholar) – double major 083342B
Bachelor of Engineering Honours – single major 027466K
Bachelor of Engineering Honours – double major 078311G

Engineers design and create solutions to improve everyday life, from the large scale to
the nano-level. Engineering is life in action: engineers help create clean water and waste
recycling, reliable food sources and storage; they design medical equipment, improve
infrastructure and find more sustainable energy sources.

Engineers connect communities by designing integrated transport and
telecommunications systems to reduce congestion, they develop cost effective modules
for space travel and invent new materials to improve medical and manufacturing
technologies.

A professional engineer has a range of highly transferrable skills including problem
solving, critical analysis, project management, creative design, teamwork and
communication.

Your degree includes a 12-week hands-on industry placement. You may gain credit
for relevant work experience, either in Australia or overseas, by participating in our
Professional Options Program.

The Women in Engineering Network (WIEN) provides support for women studying
Engineering, including $500 bursaries for high-achieving female students.

FLEXIBLE FIRST YEAR

You will study a common first year allowing you to learn more about engineering and
its different fields before deciding which discipline to study at the end of first year. The
common first year provides you with sound fundamentals in mathematics, statistics,
physics, chemistry, computing, engineering science and communication, mechanics,
materials and fluids. You then focus on your chosen major study from second year.

“During my degree I was able to
choose electives that really
drove my interest in sustainable
engineering. I also got to participate in
work experience in the UOW Sustainable
Engineering Integrated Learning Space, or
SEILS for short. This included a trip to Sri
Lanka to observe firsthand how
sustainable technologies were being
implemented in a developing economy.

“Now I’ve secured a graduate role with
Sydney Water. I was one of 25 successful
applicants out of 1,600, and I believe it
was the practical experience at UOW that
gave me the edge.”

MATT MCCANN
Bachelor of Engineering (Honours) – Mechanical Engineering (2014)
Graduate Program Role, Sydney Water
CIVIL

go.uow.edu.au/beng-civ

Civil engineers build and maintain the infrastructure of advanced modern living. They work on everything from buildings to bridges, tunnels and dams, highways and airports to power plants, water and sewerage systems.

Using computer technologies and advanced materials, civil engineers design structures that meet the needs of a growing population while protecting the environment, reducing the dangers from natural phenomena and considering future needs of the community.

The later years of the degree branch into more specialised areas including: Structural Engineering, Water Engineering, Geomechanics, Construction Engineering, Engineering Management, Engineering Applications and Design, Transport and Surveying.

COMPUTER

go.uow.edu.au/beng-comp

Computer engineers design computers and/or computer systems, hardware and software to control sensors, embedded devices and manufacturing or industrial plants.

You will study electrical and electronic engineering, software design, and hardware-software integration, from the development of supercomputers to circuit design.

This field of engineering not only focuses on how computer systems themselves work, but how they integrate into the larger picture. Specialist expertise in the fields of computer architecture and software design is applied to combine hardware and software solutions to solve practical problems.

Computer engineers can choose to work across a wide range of sectors including manufacturing, medical, transport, telecommunications, government, mining and finance, any industry which requires personnel with expertise in the design and applications of computer hardware, especially the interfacing of computers with other machinery.

ELECTRICAL

go.uow.edu.au/beng-elec

Electrical engineering focuses on electrical and electronic devices and systems, computer systems, telecommunications, control and electrical power engineering. Electrical engineers play a vital role in renewable energy generation, heavy industry and manufacturing installations, robotics and automation, mining and electrical power distribution.

You will study electricity generation and distribution (including renewable energy), electrical power quality, machines and drives, power electronics, control systems and automation, giving you the specialist knowledge needed to move into the industry.

It is possible to specialise in any of the following sub-disciplines:

- control engineering focuses on integrated sensors and control systems
- electronics engineering focuses on semi-conductors and electronic components in the design and development of engineering systems
- power engineering, dealing with the generation, transmission and distribution of electricity

Electrical engineers are sought-after professionals for their expertise in the development and application of sustainable electrical and electronic systems across a wide range of sectors.

ENVIRONMENTAL

go.uow.edu.au/beng-env

The key priority for environmental engineers is a concern for the environment and how it interacts with people and projects. Their work involves the development of engineering solutions to environmental problems impacting our land, water and air quality, as they aim for sustainable development.

The field embraces broad environmental concerns, including water quality and supply, groundwater protection and remediation, wastewater treatment, indoor and outdoor air pollution, solid and hazardous waste disposal, supply of safe drinking water, cleaning contaminated sites, preserving sensitive wetlands, and prevention of pollution through product and process design. Environmental engineers balance competing technical, social and legal issues concerning the use of environmental resources.

In your third and fourth year of the major you will branch into more specialised areas including: water quality engineering, air and noise pollution control, solid and hazardous waste management, environmental engineering design, and site remediation.
MATERIALS
go.uow.edu.au/beng-mat
Technology can only advance if someone creates the materials needed to turn ideas into reality. Materials engineers apply knowledge of science and engineering to turn raw materials into finished products: everything from construction materials and consumer goods to advanced electronics and biomedical implants such as artificial muscles and bionic eyes. They understand how the structure and properties of materials can be controlled by composition and processing. They design and select materials and processing methods to suit a particular application.

Opportunities are huge, as the field supports every branch of engineering. Graduates work everywhere, from mining, materials processing, and manufacturing to aerospace and biotechnology. Many are researchers, creating new materials like superconductors and nanoparticles. Materials engineers play a key role in reducing environmental impact through recycling, redesigning processes to reduce waste, and developing high performance materials for new energy technologies.

MECHANICAL
go.uow.edu.au/beng-mech
Mechanical engineers design, build, test and maintain all kinds of machines from robots to cars to space vehicles.

They design, build and test new forms of environmentally safe technologies such as solar energy, solar vehicles, and wave and wind energy. They are also involved in advanced manufacturing, materials handling, powder technology, automotive technology, and biomechanics.

Key mechanical engineering subjects at UOW include control of machines and processes, process design and analysis, manufacturing process analysis, manufacturing systems, sustainable energy, transport and engine technologies, dynamics of engineering systems, fluid power, and heat transfer and aerodynamics.

You can select electives from a number of specialist areas in your final year including: sustainable energy and engineering systems, manufacturing engineering, applied mechanics, automotive and bulk materials handling.

MECHATRONIC
go.uow.edu.au/beng-mtron
Mechatronic engineering is the combination of mechanical, electrical and computer technologies. The goal is to realise products, systems and processes that are more efficient, intelligent and cost effective than what came before.

Industrial robots are a famous example of mechatronic engineering: computer-controlled mechanical arms capable of performing manual labour with greater strength, speed and efficiency than a human. The reality is computer control of systems is so commonplace in homes, business and industry that nearly everyone uses a mechatronic system every day, from washing machines to central air-conditioning, cameras and computer printers.

A Mechatronic engineer’s skill for combining and refining elements to improve the whole makes them valuable in fields such as digital electronics, manufacturing, information technology and robotics.

MINING
go.uow.edu.au/beng-min
Mining engineers apply science, geoscience, engineering and technology to the efficient exploration and extraction of minerals from the earth, turning raw materials into valuable products.

The other important area for these engineers is mining safety, where their knowledge of mine design and practices ensures the safety of workers, efficient extraction, and remediation at the end of the mine’s life. Our course combines intellectual and professional training with practical learning through field visits.

The focus is on mining engineering and the design of engineering structures, with emphasis on mining methods, ventilation, environmental engineering, rock mechanics, computer applications, mineral beneficiation, mining economics and industrial management.

The final sessions of the course are professionally oriented with the inclusion of subjects such as mine planning, occupational health and safety aspects of mining, mine water, ocean engineering, geostatistics and the environmental impact of mineral operations.

TELECOMMUNICATIONS
go.uow.edu.au/beng-tel
Telecommunications engineering deals with large-scale data networks, such as the internet and other devices and systems that represent, store and transmit analog and digital information. This includes data transmission, equipment, customer access technology, analog and digital radio and television systems, satellite communications, global navigation, mobile communications and remote sensing/telemetry systems.

You’ll be trained to take up roles as telecommunications engineers focusing on the transmission and management of information through channels such as coaxial cable, optical fibres or free space. You will study data communications, control theory, digital signal processing and communications systems.

You can specialise in data, voice and video communications, transmission through wireless and wired media, predicting and modelling communication systems performance and detecting or correcting errors in transmission.

PROFESSIONAL EXPERIENCE
Students in all majors undertake a minimum 12 weeks’ industry experience at an approved professional placement.
Bachelor of Science (Materials)

go.uow.edu.au/bsci-mat

ATAR 78
DURATION 3 years
STARTS Autumn (February), Spring (July)
LOCATION Wollongong
UAC 757636
CRICOS 073927D

Materials transform our world—from the optical fibres used in telecommunications, the silicon used in microchips, to the nanotechnologies changing our medical care. Materials science is about how we apply science in designing and testing new materials, how we explore the physics and chemistry of materials, and how we can improve the existing materials on which our societies and industries are built.

WHAT YOU STUDY

When you study materials science you’ll explore the ways in which new materials are changing our world. You’ll find out how to measure and control the strength of metals and polymers, learn about the structure of crystals and glasses, or discover how semiconductors work.

Core materials studies include the detailed structure of the properties of metals, alloys, ceramics, polymers and composites. Electives in second and third years are selected from a list of subjects in the fields of materials, chemistry or science and technology studies.

A detailed pattern of study and degree options are available at go.uow.edu.au/bsci-mat

UOW graduate Kimberley Abbott shows what it means to think like an engineer—on a trip to India she saw how waste material from a granite quarry could be used to break an entire village’s poverty cycle. Now she is CEO of Roka, a company that empowers women in India who create beautiful jewellery from powdered stone, and provide much needed extra income for their families.

“We have faced many challenges with Roka. We not only had untrained illiterate women, but we were in isolated villages with no electricity, no water and no way to use tools. Now we have hired a staff member in India to manage the women so things run much smoother and faster.”

“Business can be the great engine that lifts billions out of poverty, but it needs to be a values-driven, where profit is the enabler, but not the motive. For us the bottom line is where it belongs—at the bottom.”

KIM ABBOTT
Bachelor of Engineering Honours (Mechanical Engineering) – Bachelor of Science (Exercise Science)
CEO, Roka Jewellery
Junior Bid Manager, Thales Australia
CAREERS

CIVIL
Rail Engineer | Structural Engineer | Hydraulic / Water Resources Engineer | Materials and Testing Engineer | Pipeline Engineer | Harbour Engineer | Highway Engineer | Local Government Engineer

COMPUTER
Computer Architect | Data Communications Specialist | Wireless Communications Network Engineer | Hardware Design Engineer | Fibre-optic Network Designer | Hardware Development Engineer | Computer Engineer | Embedded Systems Engineer | Digital Electronics Circuit Designer | Signal Processing Engineer

ELECTRICAL
Electronic Circuit Designer | Biomedical Systems Engineer | Embedded Software Engineer | Electrical Engineer | Electronic Engineer | Communications Engineer | Power Engineer

ENVIRONMENTAL
Coastal Management Engineer | Hydrologist | Water Treatment Engineer | Pollution Management Engineer | Irrigation Engineer | Geoenvironmental Engineer

MATERIALS
Manufacturing Engineer | Mineral Processing Engineer | Nanotechnologist | Tribologist | Metallurgist | Pyrometallurgist | Biomaterials Engineer

MECHANICAL
Automotive Engineer | Building Services Engineer | Control and Instrumentation Engineer | Manufacturing Systems Engineer | Electrical Design Engineer

MECHATRONIC
Automotive Engineer | Biomechanics Engineer | Robotics Engineer | Control and Instrumentation Engineer | Manufacturing Systems Engineer | Electrical Design Engineer

MINING
Open Pit Mining Engineer | Underground Mining Engineer | Coal Mining Engineer | Mining Engineer Consultant | Mining Engineer Academic/Researcher

TELECOMMUNICATIONS
Broadcasting Technician | Communications Technician | Electrical Engineering Associate | Electrical or Electronics Engineering Technologist | Electronic Equipment Technician | Electronics Engineer | Optical Systems Engineer | Telecommunications Field Engineer

ENGINEERING SCHOLARS’ PROGRAM

Engineering Scholar degrees are designed to provide an enriched education experience, and to encourage high achievers to continue on to studies in Honours and research.

If you have an ATAR of 95 or above you can be admitted into the Scholars’ program. You must maintain an average mark of 80 per session to remain in the degree.

As a Scholar you receive the following special privileges:
- $500 per year study grant
- Access to the Summer Scholarship program where you get paid as a Research Assistant
WOMEN IN ENGINEERING

Women make up over 50% of Australia’s population and less than 10% of its engineers.* This is a problem when you consider that the work of engineers isn’t just machines or buildings: it’s solving problems for everyone’s benefit.

ENGINEERING AND WOMEN - IT JUST WORKS

The engineering industry is looking for more female graduates, as women provide different problem solving skills. High salaries, flexible working environments and unique career opportunities are some of the incentives available.

Female engineers can bring different views to the profession and inspire creative solutions to meet society’s needs, and in particular meet the needs of women. With more female engineers, companies gain a better understanding of their customers’ needs.

UOW provides a welcoming and supportive environment for women studying engineering on campus. The UOW Women in Engineering Society provides the ideal forum for female students to socialise, network with and be mentored by students, graduates and female professionals.

WOMEN IN ENGINEERING SUMMIT

The Women in Engineering Summit is an opportunity for young women in Years 10 and 11 to experience the opportunities engineering has to offer. The summit will expose you to a range of engineering disciplines including Civil, Computer, Electrical, Environmental, Materials, Mechanical, Mechatronic, Mining and Telecommunications Engineering. You will gain exposure to world-class engineering facilities at UOW and visit local engineering industry sites. It’s also a chance to meet industry leaders, academics and other women with similar interests from across NSW and ACT.

*Engineers Australia Statistical Overview: Engineers Australia, Ninth Edition, July 2012
# SCHOLARSHIPS

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<td>University of Wollongong Undergraduate Scholarships</td>
<td>$4,000 p.a for duration of degree</td>
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<tr>
<td>Engineering and Information Sciences Academic Excellence Scholarship</td>
<td>$3,000 p.a for 2 years</td>
<td>15</td>
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<tr>
<td>Engineering and Information Sciences Academic Achievement Scholarship</td>
<td>$3,000 for first year</td>
<td>20</td>
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<tr>
<td>Engineering Scholars and Advanced Scholarship</td>
<td>$500 p.a for duration of degree</td>
<td>Unlimited</td>
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<td>Women in Engineering and Information Sciences Scholarship</td>
<td>$3000</td>
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<td>Bradden</td>
<td>Up to $44,000 over 4 years</td>
<td>Varies</td>
<td>Materials</td>
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<tr>
<td>Huon Management Services Pty Ltd</td>
<td>Up to $29,000 over two years</td>
<td>1</td>
<td>Civil</td>
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<tr>
<td>Wollongong City Council</td>
<td>$10,000 for 1 year</td>
<td>2</td>
<td>Civil</td>
</tr>
<tr>
<td>Glencore</td>
<td>Up to $40,000 over 4 years</td>
<td>Varies</td>
<td>Electrical, Environmental, Mechanical or Mining</td>
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# HOW TO APPLY

Details on how to apply for the scholarships listed above are outlined at [uow.edu.au/about/scholarships](http://uow.edu.au/about/scholarships)

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In January 2012 Lloyd became part of Team UOW, a student-led collaboration between UOW and TAFE Illawarra students and staff that demonstrated how to transform a typical 1960s fibro house into an international, award-winning model of sustainability. The Illawarra Flame house was entered into and won the Solar Decathlon China 2013—the first Australian design to win.

“A big part of my motivation is social and environmental equity. The effects of climate change will impact the most vulnerable members of society and to have an equitable world we need a sustainable environment.”

“The Solar Decathlon experience was an invaluable part of shaping my career and education. Much of what we learnt during our degree was applied to the project but you simply can’t get the sort of hands-on experience on the scale that we did.”

**LLOYD NICCOL**

Bachelor of Engineering Honours (Mechanical Engineering)  
Bachelor of Commerce (Finance, International Studies)  
Building Products and Solutions Innovation Specialist, BlueScope Steel
OTHER DEGREES YOU MAY LIKE

This booklet is just a sample of the degrees on offer at UOW. Here are a few more from different study areas that may interest you.

**Bachelor of Science (Physics)**

Physics is fundamental to the study of all sciences. You’ll learn problem-solving, critical thinking and analytical skills that are in demand across all government and private sectors. You will learn the basis for making, interpreting and extending observations relating to the behaviour and structure of matter. Study areas include mechanics, thermodynamics, electricity and magnetism, vibrations, waves, optics, and modern, quantum and statistical mechanics.

go.uow.edu.au/bsci-phys

**Bachelor of Computer Science**

Computer scientists focus on designing methods, tools and writing programs for computer applications. The degree includes a core of programming and mathematics subjects as well as electives including databases, programming languages, artificial intelligence, computer security and computer graphics. In your final year you will develop your own application as part of a student team project, developing solutions to real-world problems.

go.uow.edu.au/bcompsci

**Bachelor of Mathematics**

The Bachelor of Mathematics degree teaches highly transferable skills in problem solving, data analysis, probability and variability, mathematical modelling, logistics and logic. The degree is flexible, so you can take up to one third of your subjects from other disciplines to expand your career options.

go.uow.edu.au/bmath
LEARN MORE

SEE US FOR YOURSELF
This book is a just a part of who we are and what we do. Come and meet us face to face, and we’ll show you why UOW is the place for you.

2015 UOW OPEN DAY Saturday 15 August
FREE CAMPUS TOURS Every Friday, 10am and 3pm

GET IN BRIGHT AND EARLY
Would you like to secure your place at UOW before you sit your HSC exams? Our Early Admission program can help you get there.
uow.edu.au/future/early-admission

ENGINEERING AND INFORMATION SCIENCES
+61 2 4221 3491
eis@uow.edu.au
uow.edu.au/study/engineering
eis.uow.edu.au

GENERAL ENQUIRIES
uow.edu.au/future
Within Australia: 1300 367 869
International: +61 2 4221 3218
futurestudents@uow.edu.au
facebook.com/uowfuture

UNIVERSITY OF WOLLONGONG
AUSTRALIA

PERSONALISED EXPERIENCES : WORLD-CLASS RESULTS

The University of Wollongong attempts to ensure the information contained in this publication is correct at the time of production (April 2015); however, sections may be amended without notice by the University in response to changing circumstances or for any other reason. Check with the University at the time of enquiry for any updated information. UNIVERSITY OF WOLLONGONG CRICOS: 00110E