From ancient civilisations to the modern world, engineers have used their skills to make a difference to the lives of people and their community.

The Acropolis in Greece, the Roman aqueducts, the pyramids in Egypt and the Inca and Aztec Empires, among many others, stand as testament to the ingenuity and skill of engineers from the past.

Today, engineering has become increasingly cross-disciplinary, with a massive diversity of endeavours and a world of opportunity for those in this profession. In addition to traditional engineering, career areas such as financial markets, the civil service, the film and music industry, infrastructure, the health industry, robotics, aeronautics, mobile phones, renewable energy and computer networks all need creative and innovative people like you, who can solve problems, communicate well and focus on making a difference to people and communities.

As a future engineer, you’ll need to be more adaptable and mobile than ever. With opportunities in different parts of Australia and internationally, and in both rural and urban regions, you can be adventurous. Be prepared to find your niche and seek out new opportunities wherever they may be. Engineering is an exciting field that could be a passport to a global career.
PhD, 10 years later, Robert landed his dream job as a robotics software engineer at NASA’s Jet Propulsion Laboratory (JPL) in Pasadena, California.

He is currently working with a team of scientists and engineers mobilising the ‘Hedgehog’, a diminutive, cube-shaped robot with a spiky exterior, which is designed to land on comets and asteroids where low-gravity conditions and rough surfaces make traditional driving difficult and hazardous. “It is difficult to move around on comets and asteroids because the surface gravity is very low. You can’t use traditional wheeled rovers, like the ones we have on Mars, since they would struggle to gain traction and are likely to flip up-side-down,” says Robert.

Instead, the Hedgehog tumbles over the surface of the comet as it lands and is able to come to rest on any one of its faces and still work perfectly. The spikes house instruments such as thermal probes, and act as feet while the robot hops, tumbles and flips across the surface by spinning and braking internal flywheels.

“We have recently demonstrated our Hedgehog prototypes moving around in environments similar to those found on comets or asteroids. Now, our goal is to increase the Hedgehog’s autonomy; we are working to teach it how to use on-board cameras and sensors so it can track where it is by itself and decide where to tumble next,” says Robert.

Robert’s innate pragmatism and relaxed attitude proved to be advantageous when in June 2015 he and his team tested two of their Hedgehog prototypes aboard NASA’s C-9 aircraft for microgravity research. Dubbed the ‘vomit comet’, due to its stomach-churning dips and climbs through the air to simulate weightlessness, Robert’s team tested the Hedgehog’s mobility on a range of surfaces, with experiments requiring some mid-flight reprogramming: the ultimate in ‘extreme programming’.

“We flew four times on the ‘vomit comet’, to test our robots in simulated microgravity. We did about 50 parabolas each flight, testing different robot manoeuvres on a range of surfaces,” he says enthusiastically of the tests that would turn most people sickly green.

“It was good fun, it allowed us to validate the mobility concept and we demonstrated for the first time our Hedgehog prototypes performing controlled hopping and tumbling in comet-like environments.”

Back down on Earth, Robert is working on the Hedgehog’s localisation and mapping algorithms, along with other new projects and fresh challenges. “We are also working on other extreme terrain rovers, such as ‘Axel’, a tethered robot that could one day climb down cliff faces on Mars. Axel could provide us with a unique snapshot of the geological history of Mars by looking at the varying layers of a crater wall,” he explains.

Robert’s team tested the Hedgehog’s mobility on a range of surfaces, with experiments requiring some mid-flight reprogramming: the ultimate in ‘extreme programming’.

“We flew four times on the ‘vomit comet’, to test our robots in simulated microgravity. We did about 50 parabolas each flight, testing different robot manoeuvres on a range of surfaces.”

Robert’s innate pragmatism and relaxed attitude proved to be advantageous when in June 2015 he and his team tested two of their Hedgehog prototypes aboard NASA’s C-9 aircraft for microgravity research. Dubbed the ‘vomit comet’, due to its stomach-churning dips and climbs through the air to simulate weightlessness, Robert’s team tested the Hedgehog’s mobility on a range of surfaces, with experiments requiring some mid-flight reprogramming: the ultimate in ‘extreme programming’.

“We flew four times on the ‘vomit comet’, to test our robots in simulated microgravity. We did about 50 parabolas each flight, testing different robot manoeuvres on a range of surfaces.”

Back down on Earth, Robert is working on the Hedgehog’s localisation and mapping algorithms, along with other new projects and fresh challenges. “We are also working on other extreme terrain rovers, such as ‘Axel’, a tethered robot that could one day climb down cliff faces on Mars. Axel could provide us with a unique snapshot of the geological history of Mars by looking at the varying layers of a crater wall,” he explains.

Robert has recently organised internships for two Curtin engineering students to spend six months working alongside engineers at NASA JPL in Pasadena. His advice to students interested in space exploration is to “show that you are serious about space. Differentiate yourself from other graduates by doing a PhD, or perhaps even lobby the government to fund an Australian space agency.”

“Zeroing in on the Final Frontier”

Public interest in space exploration is sky-rocketing as NASA sets its sights on the ambitious goal of sending humans to Mars in the 2030s. With blockbuster movie The Martian fuelling the buzz and plans to redirect an asteroid to orbit the moon, Curtin alumnus Robert Reid is at the forefront of the action, engineering robots to work in zero gravity.

For robotics engineer Robert Reid, rollercoaster manoeuvres in a zero-g aircraft are simply part and parcel of his job as one of the main engineers on a project that is developing mobility techniques for robots designed to move around on the surface of comets and asteroids.

“I have been interested in robotics since my childhood,” says Robert, whose calm demeanour betrays little of his high-flying aspirations where Robert’s work could prove invaluable. During this mission, a robotic spacecraft will test a number of capabilities needed for future human space missions, such as a journey to Mars. Asteroids could also potentially be mined for rocket fuel.

“The final frontiers in engineering and science are either looking outwards into the solar system or inwards into nanotechnologies,” says Robert. “I’m particularly hopeful to see humanity moving out and colonising the solar system in the near future.”
We offer a variety of engineering options, industry work experience, high-tech learning spaces, a vibrant campus life and a solid foundation in modern engineering concepts. You’ll also have access to a strong support network through our Engineering Foundation Year clinic sessions.

Engineering at Curtin is a four-year bachelor degree with a focus on engineering right from the start. It meets the stage one requirements of the pathway to professional engineer status (CPEng) from Engineers Australia.

You’ll start with the Engineering Foundation Year, which helps you transition to university study and teaches you to think things through for yourself. As well as receiving a thorough education in engineering, during the course you’ll learn to take the initiative, be confident and original, think freely and develop the skills to be an agile leader.

EXPOSURE TO PROFESSIONAL ENGINEERING PRACTICE

Exposure to professional engineering practice (EPEP) is an important part of your development as a graduate engineer and, because our courses are accredited by Engineers Australia, you will accumulate 480 hours of EPEP over the duration of your degree.

Your EPEP can include engineering vacation work, part-time jobs, site visits and technical presentations, volunteering and professional development. EPEP provides an insight into industry and complements your formal studies. You’ll be encouraged to reflect on the link between your EPEP and what you learn in your degree program.

The faculty’s WIL Partnership Coordinator will support you before and during your EPEP by ensuring that you’re well prepared to get the greatest benefit from the experience, providing host organisations with the required documentation, and developing and maintaining relationships with industry, government and community organisations to help you find EPEP opportunities.

INDUSTRY PARTNERSHIP

All of Curtin’s engineering programs are professionally recognised in Australia and in many overseas countries. Specialists from local and international engineering industries, government agencies and professional organisations regularly review our courses, which means that your course stays relevant and meets industry needs.

Industry advisory panels, financial sponsorships, student site visits and industry guest lecturers also mean that you will be exposed to some of industry’s top employers and can get to know the engineering community.

EXPLORING THE WORLD

You don’t have to stay in one spot to study your engineering degree. You can study engineering in Perth, Malaysia or both. The courses offered at Curtin’s Malaysia campus are identical in structure to those taught in Perth, meaning you can transfer between campuses and get international experience with no disruption to your studies.

Curtin University is ranked in the top 2% of universities worldwide*.

*Academic Ranking of World Universities 2015

READY TO RISE TO THE CHALLENGE?

At Curtin, you’ll learn to be:
• professional – with highly developed technical and personal qualities
• interactive – able to work in cross-discipline and multicultural teams
• communicative – able to engage with a broad spectrum of professions using a range of media
• a leader – inspiring and able to motivate yourself and others.

THE CURTIN EXPERIENCE

A four-year bachelor degree with honours

A wide range of engineering majors to choose from

An award-winning Engineering Foundation Year

Extensive industry exposure and networking opportunities

The course is accredited by Engineers Australia and internationally recognised

Opportunities to study abroad and for further practical study

Purpose-built facilities, including the $32.5 million engineering pavilion complex.

Double degree options with science or commerce

Flexible academic support options, which offer extra help for core units and difficult concepts.

*Academic Ranking of World Universities 2015
The Curtin Engineering Pavilion Complex is designed to meet your educational needs by: creating a student-centred community with increased academic engagement; enabling modern educational practice to meet societal needs and an increased focus on learning by doing; promoting student-directed and self-paced learning; further building industry support and collaboration with Curtin Engineering; providing an appropriate, innovative and motivational environment for a growing engineering student cohort; offering an inspiring student experience.

The pavilion supports these goals through its unique design features, which include: a large open work area for practical design and project work; smaller break-out rooms that can be used for meetings or group project work; re-configurable student work areas; a common room for relaxing, socialising and networking; an industry and careers space for student-industry interactions; engineering.curtin.edu.au/pavilion

5-STAR GREEN STAR RATING
The Curtin Engineering Pavilion has received a 5-star Green Star rating, based on its innovative design and technologies, which have also been developed as hands-on learning tools for Curtin’s engineering students. The building is one of only a few in Australia to be submitted to the green building council of Australia for assessment using the Green Star - Education v1 rating tool.

Rooftop water tanks harvest rainwater for use throughout the building and temperature banding reduces the power consumption of air conditioning. Overall, these initiatives can result in a 39 per cent reduction in water usage and a 42 per cent reduction in electricity consumption.

“I chose to study at Curtin because of the practical aspects, such as laboratories, which were very hands on.”
Daniel Ming Jie Weng
Mechanical Engineering

“The project rooms and structured learning areas are ideal for me. They replicate industry practice and provide the perfect environment for group assignments.”
Drennan Goodall
Chemical Engineering

The concentration of resources, expertise and facilities makes the precinct the ideal location for workshops, seminars, conferences, business and social networking events. The precinct is a meeting place for researchers and business people, as well as teachers, students and members of the community.

Benefits include:
• exposure to a vibrant research community, and to a range of industries and potential employers
• access to facilities and equipment across the range of organisations in the precinct
• industry input and co-supervision opportunities for student research projects.

Detailed information is available online: scieng.curtin.edu.au/about-us/our-facilities

The Curtin Resources and Chemistry Precinct is designed to educate and train the next generation of scientists and engineers in a range of disciplines relevant to the resources, minerals and chemical industries.

The precinct has four floors of laboratory and office space; the top floor is the Curtin wing for undergraduate teaching. There is also a hub to facilitate interaction among scientists, visitors, students and the public, with reception, meeting rooms, amenities and a café opening to a central courtyard.

The concentration of resources, expertise and facilities makes the precinct the ideal location for workshops, seminars, conferences, business and social networking events. The precinct is a meeting place for researchers and business people, as well as teachers, students and members of the community.

Benefits include:
• exposure to a vibrant research community, and to a range of industries and potential employers
• access to facilities and equipment across the range of organisations in the precinct
• industry input and co-supervision opportunities for student research projects.

The Green Electric Energy Park (GEEP) is a laboratory that can allow you to conduct advanced experiments and research projects on various types of renewable energy sources such as solar, wind and hydraulic, distributed generation using hydrogen fuel cells, battery energy storage-based micro-grids, hybrid power systems, power converters and energy storage.

Based on how the types of renewable energy sources are integrated and displayed, GEEP is unmatched in Western Australia and serves as a model for future renewable energy laboratories.

cce.curtin.edu.au/facilities/gEEP

GEEP has the following equipment:
• three different types of solar PV arrays on trackers, which follow the sun from east to west
• a horizontal axis and a vertical axis wind turbine on 11-metre towers
• a micro hydro turbine, generator, pump and tank
• fuel cell, electrolyser and hydrogen storage
• a large, central battery bank and three small battery banks
• large programmable three-phase resistive load bank and four small, single-phase load banks
• a weather monitoring station and anemometer
• seven teaching stations and four research stations
• micro-grid forming inverters and the central switching station for main grid versus micro-grid selection
• various types of power converters for grid connection, battery charging and water pumping
• a custom-designed software platform
• a large LED monitor and presentation area
• foundations and cabling for expansion of renewable energy sources.
Curtin’s four-year Bachelor of Engineering honours degree combines theoretical grounding with a practical focus to make sure you’re career-ready on graduation. You’ll start your degree with the national award-winning Engineering Foundation Year, which will prepare you for discipline-specific study in any of the following areas of engineering.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Possible Careers</th>
</tr>
</thead>
</table>
| **CHEMICAL ENGINEERING**               | Find the best sequence of chemical and physical processing operations, and the right operating conditions, to convert raw materials into higher-value products. | • chemical engineer  
• risk and safety manager  
• process engineer  
• production/operations engineer. |
| **COMPUTER SYSTEMS ENGINEERING**       | Design, plan and develop the testing of systems that have inbuilt or embedded computers. | • computer systems engineer  
• electronics engineer  
• communications engineer. |
| **CIVIL AND CONSTRUCTION ENGINEERING** | Design and construct the infrastructure that is on or in the ground, and on which modern society depends. | • civil engineer  
• building contractor  
• design engineer  
• site engineer. |
| **CIVIL AND CONSTRUCTION ENGINEERING** | Use mathematics, science and engineering principles to extract and purify metals and other marketable products from ores. | • metallurgical engineer  
• minerals engineer  
• process engineer. |
| **ELECTRONIC AND COMMUNICATION ENGINEERING** | Plan and implement wired and wireless electronic communication systems, networks, protocols and devices | • electrical engineer  
• electronics engineer  
• network controller  
• communications engineer. |
| **ELECTRONIC AND COMMUNICATION ENGINEERING** | Design and develop methods and engineering techniques for the extraction and production of oil and gas from underground (subsurface) in a cost effective and safe manner. | • petroleum engineer  
• reservoir engineer  
• production/operations engineer  
• drilling engineer  
• well completion engineer. |
| **MECHANICAL ENGINEERING**             | Design and produce products and machines to harness the energy and forces that exist in nature. | • mechanical engineer  
• mechatronic engineer  
• aeronautical engineer  
• marine engineer  
• engineering data specialist. |
| **MECHANICAL ENGINEERING**             | Plan and manage operations to exploit minerals from underground or open-pit mines, safely and efficiently. | • mining engineer  
• mine manager  
• consulting engineering  
• mining company director. |
| **MINING ENGINEERING**                 | Create smarter products, devices and processes, and advance industrial production through automation and the use of robotics. | • mechanical engineer  
• mechatronic engineer  
• automation engineer  
• engineering data specialist. |
| **PETROLEUM ENGINEERING**              | Plan and manage operations to exploit minerals from underground or open-pit mines, safely and efficiently. | • mining engineer  
• mine manager  
• consulting engineering  
• mining company director. |
| **PETROLEUM ENGINEERING**              | Design and develop methods and engineering techniques for the extraction and production of oil and gas from underground (subsurface) in a cost effective and safe manner. | • petroleum engineer  
• reservoir engineer  
• production/operations engineer  
• drilling engineer  
• well completion engineer. |
| **PETROLEUM ENGINEERING**              | Use mathematics, science and engineering principles to extract and purify metals and other marketable products from ores. | • metallurgical engineer  
• minerals engineer  
• process engineer. |
| **PETROLEUM ENGINEERING**              | Design and develop methods and engineering techniques for the extraction and production of oil and gas from underground (subsurface) in a cost effective and safe manner. | • petroleum engineer  
• reservoir engineer  
• production/operations engineer  
• drilling engineer  
• well completion engineer. |
| **MECHATRONIC ENGINEERING**            | Use mathematics, science and engineering principles to extract and purify metals and other marketable products from ores. | • metallurgical engineer  
• minerals engineer  
• process engineer. |
| **MECHATRONIC ENGINEERING**            | Design and develop methods and engineering techniques for the extraction and production of oil and gas from underground (subsurface) in a cost effective and safe manner. | • petroleum engineer  
• reservoir engineer  
• production/operations engineer  
• drilling engineer  
• well completion engineer. |
As a Curtin student, you have the opportunity to study overseas for one or two semesters. Exchange is an exciting opportunity to experience another culture and add a unique edge to your Curtin degree.

More opportunities to study overseas
Depending on your area of study, you may have short-term opportunities to study overseas. Ask your faculty about international study tours, internships, short courses and practicum opportunities.

An international exchange is your chance to travel while learning, broadening your horizons and bringing you into contact with new places and cultures.

We have partnerships with universities across Europe, Asia and North and South America. If you choose a formal exchange program, your overseas studies are credited towards your degree.

Financial assistance is available to help with travel costs, including scholarships, travel bursaries, Commonwealth grants or an OS-HELP loan. Conditions apply.

Travelling while you study has many benefits including:

• improving your cultural awareness
• developing your independence and initiative
• boosting your confidence
• broadening your networks and potentially increasing your employability.

If you’re interested in studying overseas, and want to learn about eligibility requirements, visit our student exchange website: outboundstudy.curtin.edu.au

In addition to our main campus in Perth, we have campuses in Kalgoorlie, Singapore and Malaysia, as well as course delivery through partner institutions worldwide.

PERTH
Stepping foot onto the Bentley Campus for the first time is exciting. This is a place where you’ll make new friends, get involved in clubs and activities, build your life skills and prepare for working life. It’s fun, easy to get to on public transport and there is always a lot to do.

There are a variety of on and off-campus housing options, innovative learning spaces and a range of support services to help you enjoy life and succeed in your studies. Your experiences here, and your interactions with other students and academics, can change your life.

We’ve developed a master plan to turn the campus into a cultural hub, bringing together education, business, technology, housing, public transport, the arts and recreation.

The changes are already starting to show: daily performers and pop-up food vans are already redefining the campus.

The sense of community is strengthening within the classroom too, with innovative new learning spaces that promote collaboration.

KALGOORLIE
Curtin WA School of Mines (WASM) is located at both Curtin’s Perth Campus and in Kalgoorlie, a dynamic mining town in Western Australia’s goldfields region.

The Kalgoorlie Campus provides exposure to industry, as well as access to professionals from some of Australia’s largest gold and nickel producers.

Student housing is located only a short walk from the campus at Agricola Residential College, which has a recreational room, squash court, music room, weights and training room, as well as free-to-use barbecues in the outdoor leisure area.

INTERNATIONAL CAMPUSES
Curtin has a growing international presence, with offshore campuses in Singapore and Malaysia.

We offer several science and engineering courses at our Malaysia campus, which is located in Sarawak on the island of Borneo. The campus has contemporary equipment and facilities, on-campus housing, and sophisticated technology that links students to resources in Perth.

The courses offered at our Malaysian campus are identical in structure to those at the Bentley Campus, meaning you can transfer between campuses with no disruption to your studies.

INTERNATIONAL PARTNERS
We also deliver programs in science and engineering at partner institutions overseas.

Partnership agreements with institutions in China, Hong Kong, India, Indonesia, Malaysia, Singapore, Sri Lanka, Thailand and Vietnam mean that if you’re an international student already studying in your home country, you can transfer to our Perth campus to complete all or part of your degree.

INTERNATIONAL CAMPUSES
Curtin has a growing international presence, with offshore campuses in Singapore and Malaysia.

We offer several science and engineering courses at our Malaysia campus, which is located in Sarawak on the island of Borneo. The campus has contemporary equipment and facilities, on-campus housing, and sophisticated technology that links students to resources in Perth.

The courses offered at our Malaysian campus are identical in structure to those at the Bentley Campus, meaning you can transfer between campuses with no disruption to your studies.

INTERNATIONAL PARTNERS
We also deliver programs in science and engineering at partner institutions overseas.

Partnership agreements with institutions in China, Hong Kong, India, Indonesia, Malaysia, Singapore, Sri Lanka, Thailand and Vietnam mean that if you’re an international student already studying in your home country, you can transfer to our Perth campus to complete all or part of your degree.
Get the most out of your time at university. Join a student club or the guild and get to meet new people, attend great social functions and make friendships that could extend beyond your university years.

Joining a club gives you the opportunity to build new skills and network with industry experts, which can enhance your career prospects.

CURTIN MOTORSPORT TEAM
The Curtin Motorsport Team (CMT) designs and builds a small, open-wheel racing car for entry in the annual Formula SAE-A competition. motorsport.curtin.edu.au

CURTIN ENGINEER’S CLUB
The Curtin Engineer’s Club (CEC) holds regular social events, including Curtin’s largest student ball, the Ignite Ball. Many of these events are sponsored and attended by industry members. cec.curtin.edu.au

CURTIN ROBOTICS CLUB
Meet other students who are interested in the development and use of robotics and electronic devices. You can engage in exciting and educational projects, as well as local and international competitions.

WOMEN IN ENGINEERING
The Women in Engineering Curtin Division (WiECD) is dedicated to the support and development of female students in science, technology, engineering and maths. WiECD is sponsored by companies such as Hatch, Rio Tinto, Wesfarmers, GE Oil and Gas, Monadelphous and Woodside. engineering.curtin.edu.au/women.cfm

WASM WOMBATS
The WASM Wombats train in various forms of traditional mining techniques and compete overseas at the World Mining Games, which has led to their international reputation for success. The team is based at Curtin’s Kalgoorlie Campus at the Western Australian School of Mines.

Scholarships enable you to realise your potential. Some scholarships even offer networking opportunities, overseas study or on-the-job experience.

SCHOLARSHIP ALERT
Sign up for Curtin’s Scholarship Alert. After you complete a brief profile, we’ll let you know whenever we have a scholarship that’s right for you. You’ll receive a list of all scholarships that match your criteria along with an email whenever a new scholarship opens. You’ll also get a reminder before the application closing date. scholarships.curtin.edu.au/subscribe

International students
There are a number of international student scholarships provided by the University and the Australian Government. To find out more, visit: international.curtin.edu.au/scholarships

“The BHP Billiton Science and Engineering Scholarship allowed me to devote a lot of my time to my studies. The scholarship gave me the opportunity to meet industry professionals from a leading global resource company and enhanced the possibility of obtaining employment with BHP Billiton, either during my studies or as a graduate.”

Michael Assmann
Bachelor of Engineering (Metallurgical)

Detailed information is available online:
guild.curtin.edu.au/clubs

Detailed information is available online:
scholarships.curtin.edu.au
If you don’t have the marks or qualifications to study engineering at Curtin, don’t worry – we have several other pathways to help you start your university experience.

**MULTIDISCIPLINARY SCIENCE**
The Bachelor of Science (Multidisciplinary Science) can be an alternative entry pathway into Curtin’s engineering courses if you have met the requirements for entry into the Bachelor of Science, but haven’t qualified for entry into the Bachelor of Engineering.

By selecting appropriate units in your first year, the multidisciplinary science major can be used as a stepping-stone to catch up on course prerequisites and to demonstrate your capacity to complete the engineering program.

**ENABLING COURSE IN SCIENCE, ENGINEERING AND HEALTH**
This one-year enabling course is taught in collaboration with Canning College and Tuart College, and provides the background for you to gain entry into a degree in science or engineering. You can study subjects such as chemistry, human biology, information technology, mathematics and physics.

Upon completion, you are guaranteed entry into the Bachelor of Science (Multidisciplinary Science). You will also be eligible to apply for entry into the Bachelor of Engineering; however, entry is competitive and places are subject to availability.

**AUSTRALIAN QUALIFICATIONS FRAMEWORK ADVANCED DIPLOMA VIA TAFE**
Curtin recognises the Advanced Diploma (in an engineering discipline) as meeting the requirements for entry into the Bachelor of Engineering. Depending on your program, you may be eligible for up to one-year credit for recognised learning (CRL). You must also be able to provide evidence of English competency.

**CURTIN COLLEGE**
Curtin College is located on Curtin’s main campus in Bentley and has an integrated entry pathway to Curtin University.

The college offers a range of programs, from pre-university studies to higher education diplomas, all of which provide you with the qualifications and skills that will prepare you for the requirements of tertiary study.

Upon successful completion of Curtin College’s Diploma of Engineering, you will have guaranteed entry into the second year of Curtin’s Bachelor of Engineering.

curtincollege.edu.au

**ALTERNATIVE ENTRY PATHWAYS**
Find out more:
futurestudents.curtin.edu.au/school-leavers/how-to-get-in/flexible-entry-pathways/
To apply to study a bachelor degree at Curtin you normally need to have:

- graduated from high school and met the requirements of the Western Australia Certificate of Education (WACE)
- obtained the required ATAR for the course you wish to study
- received a scaled mark of at least 50 in: English ATAR, Literature ATAR, or English as an Additional Language/Dialect ATAR.

Reference Key

<table>
<thead>
<tr>
<th>Degree</th>
<th>The award title.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisites</td>
<td>Subjects or study units you must complete before you can start a university course.</td>
</tr>
<tr>
<td>Desirables</td>
<td>Courses that will be of benefit to your university course but are not essential for eligibility.</td>
</tr>
<tr>
<td>STAT</td>
<td>The Special Tertiary Admissions Test. It is only available to mature-age students and is not accepted as a means of entry to all Curtin courses. Mature-age students are advised to contact the relevant faculty before applying.</td>
</tr>
<tr>
<td>STAT elements</td>
<td>V= Verbal, WE= Written English, Q= Quantitative</td>
</tr>
<tr>
<td>Study mode</td>
<td>F= Full-time, P= Part-time, E= External, O= Online</td>
</tr>
<tr>
<td>Campus</td>
<td>Location of your course.</td>
</tr>
<tr>
<td>Portfolio entry</td>
<td>Demonstrating your potential to succeed at university by submitting evidence of your academic achievements and qualifications, your aptitude and preparedness in your chosen course and other qualities associated with success.</td>
</tr>
<tr>
<td>Intake</td>
<td>Feb = You can start the course at the beginning of the calendar year. Jul = You can start the course mid-year.</td>
</tr>
</tbody>
</table>
The Engineering Foundation Year was developed in partnership with industry to create a curriculum that is reflective of engineering practice, and won a national award in the category of Programs that Enhance Learning for ‘The First Year Experience’.

The Bachelor of Engineering begins with the award-winning Engineering Foundation Year. The foundation year and its purpose-built first year studio promote the concept of ‘learning by doing’.

You will study the fundamental concepts and develop the required skills common to all areas of engineering. You will have a great opportunity to explore the range of engineering disciplines available to you before choosing your engineering major from your second year.

**STRUCTURE**

Your Engineering Foundation Year will involve:

- traditional, full-class lectures
- small group tutorial work
- hands-on laboratory work
- industrial site visits and follow-up case studies
- team-based design and simulation projects
- web-based learning resources, bulletin boards, online tutorials and quizzes
- portfolio development with an emphasis on reflection and self-evaluation.

**THE STUDIO**

The first year studio and project rooms reflect the layout of a modern office, allowing you to familiarise yourself with the style of a professional working environment. The studio also acts as a hub from which to develop social and academic networks.

Facilities of the first year studio include:

- an open-plan design office
- project meeting rooms
- one-on-one learning assistance clinics
- computing, electrical and mechanics laboratories.

**ENGINEERING FOUNDATION YEAR UNITS**

**YEAR 1 SEMESTER 1**

- Engineering Foundation - Principles and Communication
- Engineering Mathematics 1 OR Engineering Mathematics Specialist 1
- Engineering Mechanics
- Engineering Programming
- 1 optional unit

**YEAR 1 SEMESTER 2**

- Electrical Systems
- Engineering Foundations - Design and Processes
- Engineering Materials
- Engineering Mathematics 2 OR Engineering Mathematics Specialist 2

**OPTIONAL UNITS**

- Engineering Chemistry
- Introduction to Renewable Energy
- Communicating with Asia for Engineers
- Engineering Physics
- Technology of Brewing and Winemaking
- Evolution, Development, Successes and Failures of Engineering
- Introduction to Mining and Metallurgy
- Introduction to Astronomy
- Planetary Science
- Planet Earth
- Materials and Technology
- Design for Small Craft
- Modern Physics
- Scientific Photography
Chemical engineering covers the development, design and operation of processes for the extraction, conversion and purifi cation of materials that is based on both chemical and biological systems.

You will explore the theory and practice required to plan and supervise fi lling and well-completion programs, design and select fi lling and production equipment; manage reserves, and design and manage oil and gas processes.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior fi rst aid training to graduate from this course.

CAREER OPPORTUNITIES
This course can help you become a process engineer, laboratory worker, or chemical engineer. Graduates may work in gas processing, oil refining, petrochemicals, polymers, minerals processing, agrochemicals, automotive and aerospace materials, semiconductors, pharmaceuticals and the emerging bioengineering and biotechnology industry.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Hons) in Chemical Engineering and BSc (Chemistry, or Extractive Metallurgy) or BCom (Accounting, Economics, Finance; Management).

### COURSE ESSENTIALS

**INDICATIVE ATAR 2016**

<table>
<thead>
<tr>
<th>CRICOS CODE</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>072467B</td>
<td>4 years</td>
</tr>
</tbody>
</table>

**STAT LOCATION**

Not accepted Bentley, Malaysia

**STUDY MODE**

F, P

**PREREQUISITES DESIRABLES**

See below*

**INTAKE**

Feb, Jul

*Mathematics: Methods ATAR and at least one of the following courses: Physics ATAR, Chemistry ATAR and Engineering Studies ATAR.

**COURSE STRUCTURE**

**Year 1**

Engineering Foundation Year

**Years 2, 3 and 4**

Stream specifi c units

- Oil and Gas Stream
- Chemical Engineering Stream

Core units

<table>
<thead>
<tr>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles and Processes in Chemistry</td>
</tr>
<tr>
<td>Process Principles</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>Process Heat Transfer</td>
</tr>
<tr>
<td>Chemical Engineering Thermodynamics</td>
</tr>
<tr>
<td>Reactivity and Function in Chemistry</td>
</tr>
<tr>
<td>Process Mass Transfer</td>
</tr>
<tr>
<td>Reaction Engineering</td>
</tr>
<tr>
<td>Process Instrumentation and Control</td>
</tr>
<tr>
<td>Process Safety and Risk Management</td>
</tr>
<tr>
<td>Process Economics and Management</td>
</tr>
<tr>
<td>Chemical Engineering Design Project</td>
</tr>
</tbody>
</table>

**WAGES: WEEKLY EARNINGS BEFORE TAX**

Source: joboutlook.gov.au

- Full Time Earnings: $1,591 per week
- All Earnings: $1,591 per week

**CURTIN is ranked in the TOP 100 in the world for chemical engineering**

*QS World University Rankings by Subject 2015

**CHEMICAL ENGINEERING**

Chemical or ‘process’ engineering involves fi nding the best sequence of chemical and physical processing operations, and the right operating conditions, to convert raw materials into higher-value products.

A great variety of process industries serve the needs of society. Among the more familiar are petroleum reﬁ ning, gas processing, petrochemical and polymer production, bio-processing and bio-production, biopharmaceutics and food processing, fertiliser manufacture, cement and lime production, minerals and metals extraction and reﬁ ning, paper and board manufacture, biomass and sugar reﬁ ning, production of industrial and ﬁ ne chemicals.

After you complete the Engineering Foundation Year you can specialise in one of the following streams:

- Chemical Engineering
- Oil and Gas

You can also complete 12 weeks of professional practice and complete senior ﬁ rst aid training to graduate from this course.

### CAREER OPPORTUNITIES

- Process engineer
- Laboratory worker
- Chemical engineer

Graduates may work in gas processing, oil reﬁ ning, petrochemicals, polymers, minerals processing, agrochemicals, automotive and aerospace materials, semiconductors, pharmaceuticals and the emerging bioengineering and biotechnology industry.

### PROFESSIONAL RECOGNITION

Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

### DOUBLE DEGREES AVAILABLE

BEng (Hons) in Chemical Engineering and BSc (Chemistry, or Extractive Metallurgy) or BCom (Accounting, Economics, Finance; Management).

### CURTIN's RANKING

Curtin University is ranked in the TOP 100 in the world for chemical engineering.*QS World University Rankings by Subject 2015*
Civil engineers design and construct our infrastructure. Every structure that is on or in the ground is the work of civil engineers. They build bridges, roads, harbours, highways, dams, irrigation and water supplies, hydro-electric projects, tall buildings and other large structures.

As our built environment becomes increasingly complicated, ambitious construction projects can only be completed by teams of people with different skills, working together. The civil engineer is central to this process.

In your first two years, you will develop basic scientific, mathematic and practical skills, and learn how to use these skills to solve engineering problems, first in our Engineering Foundation Year and then by developing specific civil engineering attributes.

In your third year, you will learn to apply these skills in structural analysis and design, materials, geotechnical engineering, construction engineering, hydraulics and professional practice.

In your final year, you will consolidate these engineering skills to the level of an engineering graduate. Speciality options include the environment, transport, public health or advanced structural design.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

CAREER OPPORTUNITIES
Upon graduation you may find employment with consulting engineers, large contractors, specialist subcontractors and government authorities who are working to meet the challenges of creating and maintaining our infrastructure. Later in your career, you may choose to establish your own consultancy as an expert in your field. Civil and construction engineers have skills that are readily transferable between employers and they often find work internationally.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Hons) (Civil and Construction Engineering) and BSc (Mining) or BCom (Accounting; Economics; Finance; or Management).
BACHELOR OF ENGINEERING (HONS)
COMPUTER SYSTEMS ENGINEERING

The most important job of a computer systems engineer is not simply to engineer computer technology, but to understand how that technology fits into a bigger picture.

Many recent technological advancements are underpinned by computer systems. The range of uses for microprocessors is increasing, from smart phones and games consoles to antilock brakes, aircraft flight control systems, robots and global telecommunications. These tiny control devices function as part of a much larger system and the technology is advancing rapidly.

In this major, you will gain the skills and understanding needed to design and operate the next generation of embedded computer systems, accurately, reliably and safely.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

CAREER OPPORTUNITIES
Uses for embedded systems can be found increasingly in the office, home and factory. This major will open up opportunities in industry, from manufacturing to application engineering and computer hardware design.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (GPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Hons) (Computer Systems Engineering) and BSc (Computer Science)

Employment for this occupation rose very strongly in the past five years. [Forecast] employment for ICT support and test engineers to November 2019 is expected to grow strongly.*

Global demands on resources have placed an urgent emphasis on supplying affordable, environmentally responsible power. As a power engineer of tomorrow, you will be at the forefront of advancements in grid systems, IT innovations and power technologies.

In this major, you will study power generation and distribution, electrical machines, electronics and power quality, as well as renewable energy sources, alternative fuel systems and future energy infrastructures. In your final year of study, you will undertake a major research or design project.

CAREER OPPORTUNITIES
This major opens up a wide range of career options, allowing you to help solve some fundamental global challenges.

With the triple challenge of climate change, security of energy supplies and affordability, the power industry will continue to need engineers. Many graduates begin their careers with energy supply authorities and other large-scale users of electrical energy, such as mining companies.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Electrical Power Engineering) and BCom (Accounting, Economics, Finance, or Management).

CAREER OUTLOOK
The earnings of electrical engineers are high – in the tenth decile.*

CURTIN’S GREEN ELECTRIC ENERGY PARK
Hailed as one of the ‘new initiatives in power engineering education’ by the IEEE when it opened in 2012, Curtin’s Green Electric Energy Park (GEEP) adds an exciting element to your electrical power engineering course.

The park features renewable, energy-based power electric generation technology including solar photovoltaic arrays, wind turbines, micro-hydro turbines and fuel stacks.

There are seven teaching stations, each dedicated to a different type of renewable energy source or storage, providing you with the opportunity to learn about different types of renewable energy sources, such as solar, wind and hydro, distributed generation using hydrogen fuel cells, battery energy storage-based micro-grids, hybrid power systems, power converters, and energy storage.

GEEP Director Sumedha Rajakaruna says GEEP adds an “exciting element to what we have to offer our students and our state in the field of science and engineering, attracting prospective students as well as academics and industry groups to the lab and to Curtin.”

ece.curtin.edu.au/facilities/geep

WEEKLY EARNINGS (BEFORE TAX)

<table>
<thead>
<tr>
<th></th>
<th>Full Time Earnings</th>
<th>All Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400 dollars</td>
<td>1152 dollars</td>
<td>950 dollars</td>
</tr>
</tbody>
</table>

BACHELOR OF ENGINEERING (HONS)

ELECTRONIC AND COMMUNICATION ENGINEERING

Electronics and communications engineering is a growing area driving many everyday technologies, from text messaging and air travel to TV and radio.

This major will give you an appreciation of the whole field. You will explore analogue and digital communications, sensors, imaging, control instruments, electronic design, signal processing, and communications and computer networks. In your final year of study, you will undertake a major research or design project.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

CAREER OPPORTUNITIES
With the broad range of skills you will acquire in this major, you will have opportunities in areas as diverse as software development, industry applications of electronic systems, fibre optics and mobile communications.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Hons) (Electronic and Communication Engineering) and BSc (Computer Science, or Physics).

CAREER OUTLOOK
Employment in this occupation rose strongly in the past five years and rose very strongly in the long term (ten years). Looking forward, employment for electronics engineers to November 2019 is expected to grow very strongly.*


Curtin was awarded the highest rating of 5 (well above world standard) in electrical and electronic engineering.*

2015 Excellence in Research Australia results

COURSE ESSENTIALS

INDICATIVE ATAR 2016

<table>
<thead>
<tr>
<th>REQUIRED</th>
<th>CRICOS CODE</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>072147B</td>
<td>4 years</td>
</tr>
</tbody>
</table>

*Mathematics: Methods ATAR and at least one of the following courses: Physics ATAR, Chemistry ATAR and Engineering Studies ATAR

INDICATIVE INTAKE

<table>
<thead>
<tr>
<th>Year</th>
<th>February</th>
<th>July</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

COURSE STRUCTURE

Year 1 Engineering Foundation Year
Year 2 Semester 1 Electrical Circuits
Mathematics and Probability Theory
Foundations of Digital Design
Advanced Engineering Programming
Year 2 Semester 2 Electromagnetic and Electromechanical Energy Conversion
Electronic Fundamentals
Signal and Systems Microprocessors
Year 3 Semester 1 Communications Engineering Fundamentals
Control Systems
Electronic Design
Engineering Electromagnetics
Year 3 Semester 2 Advanced Communications Engineering
Digital Signal Processing
Engineering Management
Advanced Digital Design
Year 4 Semester 1 Engineering Research Project 1
Engineering Sustainable Development
Year 4 Semester 2 Advanced Communications Engineering
Digital Signal Processing
Networking and Broadband Communication
Advanced Digital Design
Year 4 Semester 2 Mobile Radio Communications

SMART LIVING IN A SMART CITY

In the brave new world of big data, your life is not only shared with the people you know and love, but is also intricately connected with industry, transport, education, entertainment and your home.

Perth 2030: As you leave your workplace, a message flashes onto your retina telling you that your scheduled self-driving solar-powered car will arrive in five minutes. Ten minutes from home, your personal sensor signals your home thermostat, to ensure the ideal temperature for your arrival. The kitchen sensor also responds. You’re sent a message informing you that you need to purchase more milk. You order through your smartphone, a smart contact lens that displays messages literally right in front of your eye. Your order is not just received by the supermarket but also your car, which takes a detour to collect your milk, cleverly avoiding a traffic jam and finding the perfect parking spot.

It may sound a tad far-fetched but the journey from today to 2030 will be enmeshed in ever-evolving technology that could permeate all aspects of our lives. Information from different areas will intersect, giving us unique and personalised options as we move from street to street, aisle to aisle. Rather like connecting the dots in a dot-to-dot picture book, bringing together all this data will place us in a far bigger picture.

Underpinning this lifestyle lies an expansive, interconnected network, made up of big data, homogeneous by computers with phenomenal processing speeds working alongside billions of sensors. Aptly named the Internet of Everything (IoE), this monster network collects data emitted from billions of connected objects with individual IP addresses and streams it into intelligent devices and systems to form a distributed platform, with the purpose of reaching a specific audience at just the right moment.

Global networking company Cisco leads innovation in this area. Cisco has established eight Internet of Everything Innovation Centres around the world, the latest in Australia at Curtin University in Perth, with a second hub in Sydney at technology and data company, Sirco. The centres bring together start-up companies, industry experts, developers, researchers and academics in a collaborative environment to create a connected community, working together on cloud and network platforms, analytics and cyber security.


“It’s incredibly exciting to be announcing the new Cisco Internet of Everything Innovation Centre here in Australia,” says Bloch. “It’s our eighth centre globally, and reinforces Cisco’s commitment to innovation and our belief that Australia will be one of the world’s Internet of Everything powerhouses.”

The Cisco IoE Innovation Centre housed on Curtin’s Bentley Campus includes a state-of-the-art laboratory, a technological collaboration area and a dedicated space to show IoE in action. The centre is expected to be a catalyst for investment in next-generation technology, accelerating innovation in Australia’s resources, agriculture and astronomy sectors, and more broadly around big data.

Work is underway around the Square Kilometre Array and Woodside’s ‘Plant of the Future’ alongside planned ‘smart campus’ projects, which will address education challenges and give rise to more connected and remotely accessible labs and teaching spaces. Such interconnectivity will bring new styles of teaching and learning to Curtin, and influence functions such as efficiencies in lighting, security and ubiquitous Wi-Fi.

As the IoE gathers steam, cities around the world will increasingly ‘digitise’ their operations, creating richer living experiences and generating a multitude of business opportunities.

Before you can blink, you too will be part of this interconnected world, catching up with your friends through your smartphone as you travel from your smart workspace to your smart home, knowing that when you arrive your dinner will be cooking, the ambiente attuned to your needs and the bathroom filled to perfection.
INTELLIGENT ROBOT ASSISTS CURTIN RESEARCHERS AND STUDENTS

An intelligent robot named Baxter is the focal point of collaborative research between Curtin’s Department of Computing and researchers in the US and Europe.

Designed to work with humans, Baxter represents a new generation of intelligent manufacturing and research robots. Its unique safety features and advanced software interfaces give undergraduate, master degree and PhD students unprecedented freedom to perform cutting-edge research in these areas of robot intelligence.

In building Baxter, Curtin researchers and students have been able to leverage the work of international collaborators working on robots similar to Baxter at the National Institute of Standards and Technology in Maryland and the Technical University of Graz in Austria.

Head of Curtin’s Intelligent Robots Group and research leader Dr Raymond Sheh says that robots are now being designed to work with humans.

“Traditional industrial robots must operate in areas where humans are excluded, but Baxter has been designed to work safely alongside humans, detecting their presence and reacting to their touch,” says Dr Sheh.

“Through the efforts of researchers and students, Baxter will be able to sense and learn about its environment and tasks, and adapt to changes in its surroundings.”

“Robots that are able to measure, explain, and justify their decisions are the next frontier in an industry where risk is an all-important factor,” Dr Sheh says.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
BEng (Hons) (Mechanical Engineering) and BCom (Accounting; Economics; Finance or Management).

CAREER OUTLOOK
Employment for this occupation rose strongly in the past five years and rose strongly in the long-term (ten years). Looking forward, employment for this occupation rose strongly in the long-term (ten years). Employment for this occupation rose strongly in the long-term (ten years). Employment for this occupation rose strongly in the long-term (ten years).

“I feel that some of the key units really focus on the application of knowledge. I had a mechanical design project in one of my units that required me to design a gearbox, and that involved everything from working out the actual application of the gearbox to sizing it to make it work in a real world situation. I think that really exposed me to how report writing and how the actual engineering design process works. I really liked learning the application of it.”

Liam Richer
Bachelor of Engineering (Hons) (Mechanical)

Did you know?
There are more than 20,000 road crashes involving kangaroos in Australia every year, so a no-kangaroo robot test crash dummy, which hops like a kangaroo, is used to test how badly cars will be damaged.
Mechatronic systems can be found in most industrial and commercial products, from cars and aircraft to medical and surgical devices.

As a mechatronic engineering student, you will design and maintain electronic and computer-controlled systems, including power generators, mining and chemical plant machinery, and intelligent machines such as unmanned aerial vehicles and autonomous robots.

You will develop sound theoretical knowledge in the key disciplines of mechanics, electronics and computer systems. Project work will culminate in a major design or research project in your final year of study.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

CAREER OPPORTUNITIES
This major will equip you with a broad range of engineering skills and knowledge, enabling opportunities in disciplines such as mechanical design, instrumentation, automation and robotics.

PROFESSIONAL RECOGNITION
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia.

DOUBLE DEGREES AVAILABLE
None.

ASSISTED FINGER ORTHOSIS WINS INNOVATION AWARD
A 3D printable hand exoskeleton earned a round of applause at the Curtin Commercial Innovation Awards, netting its inventors $15,000 and valuable commercialisation assistance.

The Assisted Finger Orthosis project was developed by mechatronics engineering lecturer and researcher Dr Lei Cui, mechatronics engineering students Anthony Phan and Otto Seyfarth, Dean Research and Graduate Studies Health Sciences Professor Garry Allison, occupational therapy clinical/professional fellow David Parsons and Professor Stelarc from the Alternate Anatomies Laboratory at Curtin University.

Dr Cui said the finger orthosis project is the simplest design that can achieve active movement of all three finger joints from a single actuator or driver.

The competition attracted a record 46 applications from across the University with 12 applicants shortlisted to present to a panel of judges looking at novelty, level of development, market potential and competitive advantage.

‘Robotic exoskeletons can protect a patient’s tendons while minimising the risk of complications after hand tendon surgery,’ Dr Cui says. ‘A tailor made exoskeleton that fits an individual’s hand perfectly will define the future of hand rehabilitation’.

Did you know?
The highest temperature of a jet engine is about 1,800°C. This is 600°C hotter than lava and even above the melting point of turbine blades. Without clever cooling techniques, this would be impossible.

Robert Reid
Bachelor of Engineering (Mechatronic)
NASA’s Jet Propulsion Laboratory, California

The best part of my degree was the project units, which were ‘real’ engineering, rather than a maths class. It made you think like an engineer, in one project I had to build a robot, but it was more about teamwork and solving an engineering problem.”

COURSE ESSENTIALS

BACHELOR OF ENGINEERING (HONS)

MECHATRONIC ENGINEERING

COURSE STRUCTURE

Year 1
Engineering Foundation Year

Year 2 Semester 1
Foundations of Digital Design
Engineering Mathematics
Mechatronics Microcontroller Project
Machine Dynamics
Electrical Circuits

Year 2 Semester 2
Unix and C Programming
Linear Signals and Systems
Mechatronics Modelling Project
Engineering Management
Engineering Graphics

Year 3 Semester 1
Embedded Systems Engineering
Mechatronics Automation Project
Design of Mechanical Components
Dynamic Modelling and Control

Year 3 Semester 2
Power Electronics
Mechatronics Design Project
Manufacturing for Mechatronics
Law for Engineers
Engineering Sustainable Development

Year 4 Semester 1
Mechatronic Engineering Research Project 1
Mechatronic Systems Design
2 optional units

Year 4 Semester 2
Mechatronic Engineering Research Project 2
Professional Engineering Practice
2 optional units
In this major, you will learn to design, develop, optimise and manage the operation of metallurgical processing plants that transform low-value raw materials into useful, high-value mineral and metal products in an economical and environmentally responsible way.

You will receive a strong grounding in chemical and physical engineering, economic, environmental and sustainable principles, and the extraction of metals from ores. The course also includes a strong management component.

After your Engineering Foundation Year at Bentley, you can go directly to Curtin WA School of Mines in Kalgoorlie, or study for a second year in Perth before completing your third and final years in Kalgoorlie. Studying in Kalgoorlie will provide you with meaningful exposure to the mining industry.

WORK EXPERIENCE
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

CAREER OPPORTUNITIES
As a metallurgical engineer, you may find employment in metallurgical processing plants, engineering companies, consultancies, research and development companies, and academic, finance and banking institutions within Australia or internationally.

PROFESSIONAL RECOGNITION
Graduates fulfil the stage one competencies required by Engineers Australia as the pathway to chartered professional engineer status (CPEng), a benchmark in professional engineering. This course is also recognised by the Australasian Institute of Mining and Metallurgy.

DOUBLE DEGREES AVAILABLE
BEng (Hons) (Metallurgical Engineering) and: BCom (Accounting; Economics; Finance; Management).
Mine engineers may supervise other engineers, surveyors, geologists, scientists and technicians working on a mine site. Working in metropolitan or regional locations around the world, mining engineers can have adventurous careers.

In this major, you will study engineering as well as basic science subjects. As you progress, emphasis will be placed on mining science and technology, which involves the study of soil and rock mechanics, explosive and rock breakage, materials transport, mining methods, mine planning, project evaluation and the environment.

After your Engineering Foundation Year in Perth, you can go directly to Curtin WA School of Mines in Kalgoorlie, or study for a second year in Perth before completing your third and final years in Kalgoorlie. Studying in Kalgoorlie will provide you with meaningful exposure to the mining industry.

**WORK EXPERIENCE**
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

**CAREER OPPORTUNITIES**
As a mining engineer, you may find opportunities to travel locally and internationally. Mining engineers are employed at all levels throughout the industry, from recently qualified graduate mining engineers, through junior and senior management positions, to senior divisional consulting engineers and company directors.

**Did you know?**
The chemical symbol for gold is Au, from the Latin aurum, which means ‘shining dawn’. Gold will not oxidise, rust, tarnish, corrode, decay or deteriorate.

**PROFESSIONAL RECOGNITION**
Stage one requirements met for the pathway to professional engineer status (CPEng) from Engineers Australia. The course is also recognised by the Mining Education Australia and Australasian Institute of Mining and Metallurgy.

**PROFESSIONAL CERTIFICATION**
Graduates fulfil the educational requirements for various statutory certificates of competency (including first class mine manager, underground supervisor, quarry manager) from the WA Department of Mines and Petroleum, subject to a set period of practical experience plus additional requirements.

**DOUBLE DEGREES AVAILABLE**
BEng (Hons) (Mining Engineering) and:
BCom (Accounting; Economics; Finance; Management).

**COURSE ESSENTIALS**

<table>
<thead>
<tr>
<th>INDICATIVE ATAR 2016</th>
<th>CRICOS CODE</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>072467B</td>
<td>4 years</td>
</tr>
</tbody>
</table>

**STAT LOCATION**
Not accepted

**STUDY MODE**
F, P

**PREREQUISITES**
See below*

**DESIRABLES**
Mathematics: Specialist ATAR

**INTAKE**
Feb, Jul**

*Mathematics: Methods ATAR and at least one of the following courses: Physics ATAR, Chemistry ATAR and Engineering Studies ATAR.

**** July intake students are required to attend the Kalgoorlie Campus from their second year.

**COURSE STRUCTURE**

**Year 1**
Engineering Foundation Year

**Year 2**

**Semester 1**
Mathematics and Statistics
Thermofluids
Metallurgical Processes and Materials Handling
Mining and Metallurgy
Geological Principles

**Semester 2**
Mechanics of Solids
Resource and Structural Geology
Mine Surveying and Geographic Information Systems

**Year 3**

**Semester 1**
Mining Geomechanics
Resource Estimation
Socio-Environmental Aspects of Mining

**Semester 2**
Mine Planning
Mine Ventilation
Rock Breakage
Underground Mining Systems OR
Surface Mining Systems

**Year 4**

**Semester 1**
Hard Rock Mine Design and Feasibility
Mine Geotechnical Engineering
Mine Asset Management and Services OR
Advanced Mine Ventilation
Mining Research Project 1

**Semester 2**
Coal Mine Design and Feasibility
Mine Management
Mining Research Project 2
Underground Mining Systems OR
Advanced Mine Geotechnical Engineering OR
Surface Mining Systems

*In the Mining and Minerals category.

QS World University Rankings by Subject 2016.
Located in the hub of the oil and gas industry in Australia, Curtin University is building a reputation for excellence in the resources sector. Our researchers and academics collaborate closely with industry to develop solutions that enhance resource performance, technology and environmental management. In this major, you will learn how to evaluate, drill and then develop and mine oil and gas reserves. You will examine issues involving fluid flow through reservoirs, basic geology, the role of engineering in oil and gas production, chemical engineering, thermodynamics, hydrocarbon phase behaviour, drilling and well engineering. You will also develop an understanding of global economic trends and corporate profit margins through the study of economics, risk and project management. You will have the opportunity for practical study in fluid and reservoir rock laboratories and geodynamics lab work, and you will get industry exposure through field trips to service company offices and drilling sites.

**WORK EXPERIENCE**
You must complete 12 weeks of professional practice and complete senior first aid training to graduate from this course.

**CAREER OPPORTUNITIES**
Currently, reservoirs yield only about 30 per cent of their oil, so petroleum engineers are needed to develop methods to increase oil and gas production. Petroleum engineers are also needed to help develop newly discovered and future offshore gas fields. As a qualified petroleum engineer, you can work in a technically challenging career and benefit from being part of a worldwide community of professionals.

**PROFESSIONAL RECOGNITION**
Graduates fulfil the stage one competencies required by Engineers Australia as the pathway to chartered professional engineer status (CPEng).

**DOUBLE DEGREES AVAILABLE**
None.

**COURSE ESSENTIALS**

<table>
<thead>
<tr>
<th>BACHELOR OF ENGINEERING (HONS)</th>
<th>PETROLEUM ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDICATIVE ATAR 2016</strong></td>
<td>80</td>
</tr>
<tr>
<td><strong>CRICOS CODE</strong></td>
<td>072467B</td>
</tr>
<tr>
<td><strong>DURATION</strong></td>
<td>4 years</td>
</tr>
<tr>
<td><strong>START</strong></td>
<td>Bentley, Malaysia</td>
</tr>
<tr>
<td><strong>LOCATION</strong></td>
<td>F, P</td>
</tr>
<tr>
<td><strong>STUDY MODE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PREREQUISITES</strong></td>
<td>Mathematics: Methods ATAR and at least one of the following courses: Physics ATAR, Chemistry ATAR and Engineering Studies ATAR.</td>
</tr>
<tr>
<td><strong>DESIRABLES</strong></td>
<td>Mathematics: Specialist ATAR.</td>
</tr>
<tr>
<td><strong>INTAKE</strong></td>
<td>Feb, Jul</td>
</tr>
</tbody>
</table>

**COURSE STRUCTURE**

- **Year 1**
  - Engineering Foundation Year
  - Year 2 Semester 1
    - Process Principles
    - Fluid Mechanics
    - Introduction to Petroleum Engineering
    - Geological Principles
  - Year 2 Semester 2
    - Chemical Engineering Thermodynamics Principles
    - Processes in Chemistry
    - Mechanics of Solids
    - Petrophysics and Reservoir Properties Laboratory

- **Year 3 Semester 1**
  - Reservoir Engineering Fundamentals
  - Hydrocarbon Phase Behaviour
  - Petroleum Engineering and Geophysics
  - Formation Evaluation
  - Petroleum Geology and Geophysics
  - Reservoir Engineering Practices
  - Petroleum Production Technology
  - Drilling Engineering and Fluids Laboratory

- **Year 4 Semester 1**
  - Petroleum Economics, Risk and Project Management
  - Numerical Reservoir Simulation
  - Advanced Drilling Engineering
  - Petroleum Engineering Research Project 1

- **Year 4 Semester 2**
  - Crude Oil Processing
  - Process Instrumentation and Control
  - Petroleum Engineering Research Project 2
  - Petroleum Geomechanics

**Did you know?**
Petroleum is used to make more than 6,000 items including ink, golf bags, deodorant, footballs, DVDs, crayons, dentures, lipstick and hair colouring.
Studying a double degree is a smart choice if you are interested in more than one learning area. With two separate qualifications and a more diverse set of skills and knowledge, you could expand your career options upon graduation and go on to enjoy a particularly interesting career. You’ll study units from both courses, but the condensed program structure means you will complete two degrees quicker than if you studied them separately.

**DEGREE 1**

**BACHELOR OF ENGINEERING**

<table>
<thead>
<tr>
<th>Major</th>
<th>Science Majors: CRICOS CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Extractive Metallurgy</td>
<td>043753C</td>
</tr>
<tr>
<td>Chemistry</td>
<td>050568A</td>
</tr>
<tr>
<td>Computer Science</td>
<td>0437548</td>
</tr>
</tbody>
</table>

**COURSE ESSENTIALS**

**BACHELOR OF ENGINEERING; BACHELOR OF SCIENCE**

- **Indicative ATAR 2016**: 80
- **Duration**: 5 years full-time
- **CRICOS CODE**: 041777M
- **Study Mode**: F, P
- **Prerequisites**: See below*
- **Desirable**: Mathematics: Specialist ATAR

**BACHELOR OF ENGINEERING; BACHELOR OF COMMERCE**

- **Indicative ATAR 2016**: 80
- **Duration**: 5.5 years full-time
- **CRICOS CODE**: 077965K
- **Study Mode**: F, P
- **Prerequisites**: See below*
- **Desirable**: Mathematics: Specialist ATAR

*Mathematics: Methods ATAR and at least one of the following courses: Physics ATAR, Chemistry ATAR and Engineering Studies ATAR.

---

**Detailed unit information is available online:** courses.curtin.edu.au
## COURSE MATRIX: INTERNATIONAL

<table>
<thead>
<tr>
<th>COURSE NAME</th>
<th>CRICOS CODE</th>
<th>DURATION (FULL-TIME)</th>
<th>LOCATION</th>
<th>INTAKES</th>
<th>PREREQUISITES</th>
<th>GCE</th>
<th>HKDSE</th>
<th>IB</th>
<th>Ontario Gr 12 (best of 6)</th>
<th>ATAR (including WACE/SACE/HCE/VCE)</th>
<th>WAMFP (CPS)</th>
<th>India/Pakistan</th>
<th>Sri Lanka</th>
<th>OFFER LETTER (100 CREDIT)</th>
<th>PUBLISHED FEE (A$)</th>
<th>INDICATIVE 1 YEAR FEE (A$)</th>
<th>TOTAL INDICATIVE COURSE FEE (A$)</th>
<th>INDICATIVE ESSENTIAL INCIDENTAL FEE (A$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering (BEng) (Honours) with majors in Chemical, Civil and Construction, Computer Systems, Electrical Power, Electronic and Communication, Environmental, Mechanical, Mechatronic, Metallurgical, Mining, and Petroleum</td>
<td>072467B</td>
<td>4 years</td>
<td>Bentley, Kalgoo*</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>29</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>157,300</td>
<td>610</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>4 years</td>
<td>Malaysia*</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>29</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>RM 17,416*</td>
<td>RM 34,832*</td>
<td>RM 139,328*</td>
<td>TBA*</td>
<td></td>
</tr>
<tr>
<td><strong>DOUBLE DEGREES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering and Chemistry</td>
<td>050336F</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>10</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>196,100</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering and Extractive Metallurgy</td>
<td>043753C</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>10</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>201,000</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Civil and Construction Engineering and Mining</td>
<td>059568A</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>202,100</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Computer Systems Engineering and Computer Science</td>
<td>043754B</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>192,100</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Electronic and Communication Engineering and Computer Science</td>
<td>041777M</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,800</td>
<td>35,300</td>
<td>192,200</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Engineering (BEng) and Commerce (BComm) with Engineering (BEng) and Commerce (BCom) with majors in Chemical, Civil and Construction, Mechanical, Metallurgical, Mining, Accounting, Economics, Finance, and Management</td>
<td>086675M</td>
<td>5.5 years</td>
<td>Bentley</td>
<td>Feb, Jul</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>9</td>
<td>19</td>
<td>28</td>
<td>70</td>
<td>80</td>
<td>59</td>
<td>76%</td>
<td>10</td>
<td>17,500</td>
<td>49,700</td>
<td>204,100</td>
<td>425</td>
<td></td>
</tr>
<tr>
<td>Physics and Electronic and Communication Engineering</td>
<td>041800F</td>
<td>5 years</td>
<td>Bentley</td>
<td>Feb</td>
<td>Mathematics (including calculus), physics and chemistry.</td>
<td>5</td>
<td>15</td>
<td>24</td>
<td>60</td>
<td>70</td>
<td>53</td>
<td>65%</td>
<td>6</td>
<td>17,800</td>
<td>35,300</td>
<td>194,300</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

*This course may not be offered at all locations every year. Course majors and streams may vary across campuses.

# Fees for Malaysia are for 2016 and subject to change for 2017. Visit curtin.edu.my for the most up-to-date information.

^The indicative essential incidental fees listed in this guide are correct for 2016 and may be subject to change.

Malaysia: Incidental fees depend on your chosen course and units.

THIS TABLE APPLIES TO STUDENTS WHO ARE REQUIRED TO HOLD A STUDENT VISA TO STUDY IN AUSTRALIA. THIS INCLUDES TEMPORARY RESIDENTS.
HOW TO APPLY: DOMESTIC STUDENTS

COURSE PREREQUISITES
At least three of the following courses: Mathematics: Methods ATAR, Mathematics: Specialist ATAR, Physics ATAR and Chemistry ATAR.

DESIRABLE
Engineering Studies ATAR.

SCHOOL LEAVERS
In addition to meeting the course prerequisites for engineering, you must have achieved the following:
• graduated from high school and met the requirements of the Western Australian Certificate of Education (WACE) – or equivalent interstate certificate
• obtained an ATAR (Australian Tertiary Admissions Rank) above the cut-off score of the course you wish to study
• received a scaled mark of at least 50 in one of the following: English ATAR, Literature ATAR or English as an Additional Language/Dialect ATAR.

MATURE-AGE STUDENTS
To qualify for direct entry, you still need to have achieved the same requirements (or equivalent) as school leavers.
Your year 12 exam results are valid indefinitely and scores dating back to 1992 (including the TEA out of 400 and the TES out of 150) can be converted to the current ranking via the TISC ATAR calculator available at tisc.edu.au/calculator/atar-calculator.tisc

FIRST SEMESTER INTAKES
Applications must be made through the Tertiary Institutions Service Centre (TISC). TISC processes applications on behalf of the four public universities in Western Australia.

SECOND SEMESTER INTAKES
To apply for second semester, download an application form online: futurestudents.curtin.edu.au/mid-year-intake

CONTACT TISC
100 Royal Street
East Perth WA 6004
Tel: +61 8 9318 8000
Fax: +61 8 9225 7050
Web: tisc.edu.au

CONTACT US
Future Students Services
Tel: +61 8 9266 1000
1300 CU 1000
Fax: +61 8 9266 3331
Email: futurestudents@curtin.edu.au
Web: futurestudents.curtin.edu.au
HOW TO APPLY: INTERNATIONAL STUDENTS

If you are required to hold a student visa to study in Australia, then you can apply to Curtin as an international student (this includes temporary residents).

To apply directly to Curtin, visit: international.curtin.edu.au/apply

If you are using the services of a Curtin registered agent, you should lodge your application via the agent and contact them for any queries throughout the admission process.

COURSE PREREQUISITES
Mathematics (including calculus), physics and chemistry.

ENGLISH COMPETENCY

IELTS
Writing and speaking: 6.0
Reading and listening: 6.0
Overall band score: 6.5

TOEFL (iBT)
Reading: 13
Listening: 13
Speaking: 18
Writing: 21
Overall score: 79

CONTACT US

Curtin International
Tel: +61 8 9266 7381
Fax: +61 8 9266 2605
Email: international@curtin.edu.au
Web: international.curtin.edu.au
ATAR
Australia Tertiary Admission Rank. An ATAR provides a ranking of students, based on WACE results (or equivalent), and is used for allocating places in university courses.

BACHELOR DEGREE
Usually awarded for successful completion of an undergraduate course
BAgribus=Bachelor of Agribusiness
BEng=Bachelor of Engineering
BCom=Bachelor of Commerce
BSc=Bachelor of Science
BTech=Bachelor of Technology
BSurv=Bachelor of Surveying
BA=Bachelor of Arts

CRICOS CODE
Commonwealth Register of International Courses for Overseas Students (CRICOS) Code. Courses that have been registered with a CRICOS Code are available to international students studying in Australia or on a student visa.

CRL
Credit for recognised learning of studies undertaken at another accredited institution; or for work experience that is relevant to the area of study (usually only for postgraduate study).

DOMESTIC STUDENT
Australian citizens; Australian dual-citizens; New Zealand citizens; permanent residents of Australia and holders of humanitarian visas.

ENGLISH COMPETENCE
The essential English language requirements for admission into courses at Curtin.

ENTRY REQUIREMENTS
The specific criteria for entry into a particular course.

FULL-TIME STUDY
Constitutes at least a 75 per cent study load per semester. International students studying on a student visa are required to study full-time at 100 per cent of their study load.

INTERNATIONAL STUDENT
A student who is required to hold a student visa to study in Australia. This includes temporary residents.

MAJOR
A series of units combined to satisfy the University’s requirements in an area of study. The major is presented in your award title, usually within brackets.

MATURE-AGE STUDENTS
Applicants who are 20 years or older as at 1 March in the year of admission to Curtin.

PART-TIME STUDY
Enrolment in less than 75 per cent study load per semester.

PREREQUISITES
Subjects or study units you must complete before you can start a university course.

SCHOOL LEAVERS
Students applying for admission on the basis of their ATAR and who completed high school in the year prior to beginning university study.

STREAM
A specialty area within a major. Stream names do not appear on your award title but comprise units relevant to your chosen major.

SCHOLARSHIPS
Usually constitute a sum of money to help you pursue your studies. Scholarships are based on merit or need.

STAT
Special Tertiary Admissions Test. Refers to a range of specially designed tests administered by the Tertiary Admissions Service Centre (TISC) to assist universities in assessing suitability on mature-age students for admission to tertiary study.

TISC
Tertiary Institutions Service Centre. TISC provides services to university applicants and processes applications for first semester entry into university.

UNDERGRADUATE COURSE
An award course usually leading towards a bachelor degree.

UNIT
A discrete entity of study within a subject area that is a component of a course. Majors and streams are both made up of units.