Career Tools

Guide to Engineering Careers



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DISCLAIMER
The details provided in this guide are accurate at the time of publication but subject to change without warning. Refer to relevant websites for updated details.Published March 2023 © Career Tools

Introduction

Engineering in Australia

What do WiFi, the Cochlear hearing implant, the Sydney Opera House and Harbour Bridge, and the (black box) Flight Recorder have in common?

They are world-changing feats of engineering, achieved right here in Australia!

Engineers Australia (EA), is the trusted voice of the engineering profession. They accredit Australian engineering courses for Higher Education and VET qualifications and provide life-long training through Engineering Education Australia.

ENGINEERS AUSTRALIA

As the peak body for the profession, they recognise 16 distinct areas of engineering and accredit 40 different types of engineering courses, so it's hard to summarise what engineering is, and what engineers do, into a simple definition, but let's try:

The word 'engineering' comes from the Latin words 'ingeniare', meaning to create and 'ingenium' meaning cleverness and that's exactly what engineers are: clever creators.

Engineers combine their specialised skills in science, technology, and design to invent, make, build, and create the machines, structures, engines, and systems humankind relies upon.

Engineers see the world not as it is, but as it can be to change the world around them for the better. Their work shapes our lives and future which makes it an exciting career to explore.

Whether your dream is to feed the hungry, clean the world's oceans, create lifesaving equipment, design safe transport, faster communications, or reliable energy, as a prospective engineer you hold the potential to make real change!

If you're curious about engineering, the skills and qualifications you need, and how to get started, this guide can help. You can also learn more about Engineering in Australia and the amazing work of Australian Engineers in the Year 13 Engineering Your Future Academy (see the Get Yourself Involved section of this guide).

The Future of Engineering

Growth and Demand

Where there are problems to solve, engineers will be needed which means they are in demand in Australia and overseas.

As the global population increases and society becomes more complex, engineers will play a critical role to ensure adequate transport, power, water, telecommunications, and healthcare, which means there will be many job opportunities.



Going Green



Mechanical, Environmental and Chemical Engineers will be making more, with less. Their challenge will be to design greener, more efficient machines, devices and systems.

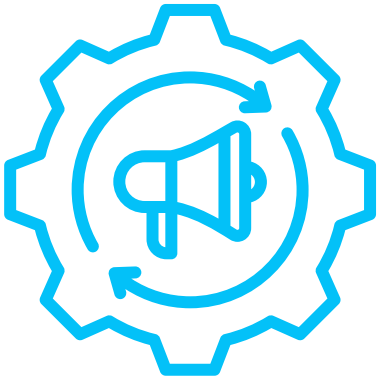
Engineers will ask how we can produce more food, water, and energy using less fossil fuel, fertiliser, and space, and they will create more sustainable materials and ways to build the things we need.

Automation

Over the next few decades, engineers will design machines and robots to replace many of the manual labour jobs humans currently perform.

Automated driving will become a reality, transforming the transport industry and increasing safety.

AI could help engineers find solutions that humans can't yet conceive.



Life as an Engineer

Working Hours

Over 80 per cent of engineers work a full time 42 - 46 hour week, similar to the 44 hour average of all jobs.



However, an engineer's hours are dependent on their industry and work environment. For example, an engineer working in the mining industry might work two weeks on site and then have two weeks off, whereas an engineer working in academia might work 9 - 5, Monday to Friday.

Working Environment

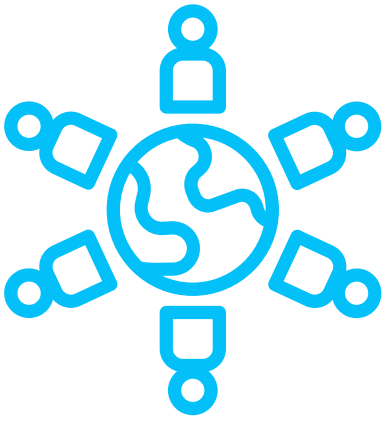


An engineer's work environment varies depending on their area of expertise, their industry and employer, and the current project they are working on.

All areas of engineering offer variety, and may even provide opportunities for travel. For example, you may need to go interstate or overseas for site visits, or you may choose to contribute to humanitarian projects in developing countries.

Workplace Diversity

Diversity is important because a broader range of perspectives lead to more innovative and creative solutions, which result in better products and technologies to meet the needs of a wider range of people.



Women are currently underrepresented in engineering so there are special initiatives, programs, and scholarships available to encourage girls' to pursue engineering careers, some of which are highlighted in the Get Your School Involved section of this guide.

Life as an Engineer

Income

Engineers' salaries are among the highest in Australia because the level of education and skill needed to solve complex problems and use specialist equipment is recognised in their remuneration.



These figures are a guide only as they will change by the time you finish your studies.

Graduate and Experienced Engineers' Salaries

After finishing your engineering qualification, you are a Graduate Engineer for your first two years of work. According to the 2022 Australian Jobs Report, the mean Australian graduate salary is approximately $65,000 per year.

Throughout your career, your salary will increase to reflect your area of expertise, your range of experience, and your level of seniority. The 2021 ABS Census reports the Australian full-time median salary is approximately $82,836 per year. Let's see how engineers' salaries compare.

	Graduate Engineers $	Experienced Engineers $
Aerospace/Aeronautical	75,833	116,000 - 137,020
Biomedical	71,400	126,000 - 137,970
Chemical	63,920	109,012 - 130,642
Civil	67,005	114,000 - 133,715
Electrical/Electronics	69,507	115,000 - 149,456
Environmental	71,400	110,000 - 127,913
Mechanical	69,660	110,000 - 131,400
Mechatronics	63,364	105,000 - 123,530

Engineering income data is from the Professional Engineers Employment and Remuneration Report 2020/21.

Life as an Engineer

Industries and Employers

Engineers work across many industries and their job roles vary enormously, so it's impossible to describe them all here.

Below is an overview of just some industries and employers of engineers in Australia.

The links in the example employer column will take you to their careers web pages where you can learn more about Australian and global engineering environments, workplaces, and projects.

These industries / sectors	Employ these engineers	Example employers include
Aviation, Defence, Maritime	Aerospace and Aeronautical, Electrical, ITEE, Mechatronics	BAE Systems, Boeing Defence Science Technology Group
Minerals, Mining, Oil and Gas, Petroleum, Power Generation and Transmission	Chemical, Civil, Electrical, Environmental, Mechanical, Mechatronics	Orica, Australia BP, Origin Energy, ExxonMobil
Construction, Disaster Management, Water and Waste	Chemical, Civil, Electrical, Environmental, Mechanical	AECOM, Arup, Coffey, Golder Associates, Parsons Brinckerhoff
Biomedicine, Health Services, Pharmaceuticals, Petrochemicals	Biomedical, Chemical, ITEE, Mechanical	Cochlear, Compumedics, Device Technologies, Therapeutic Goods Administration
Automation, Cybersecurity, Electronics, Entertainment, Robotics, Telecommunications	Electrical, ITEE, Mechanical, Mechatronics	Google, IBM, Microsoft, Nokia, Ericsson, NEC, Siemens, Telstra

Life as an Engineer

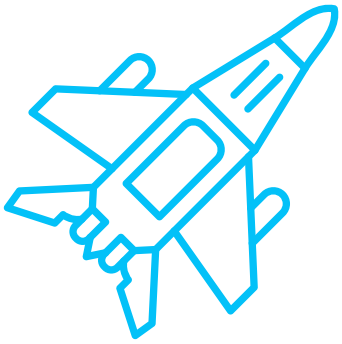
Government Employers

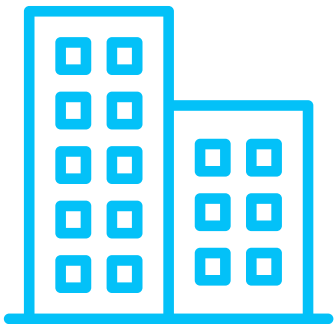
Australian Defence Force (ADF)

The ADF employs many kinds of engineers to work on equipment, weapons, vehicles, aircraft, ships, and infrastructure to keep them operating safely and effectively. There are two ways to join as a student:

- From school into an engineering degree at ADFA.
- Already studying engineering at university into a Defence University Sponsorship, which pays you a salary and your remaining course fees.

You can learn more about engineering with the ADF here.





Australian Public Service (APS)

Federal, State, and Local governments employ various kinds of engineers to supervise the design, construction and maintenance of roads, drainage systems, pedestrian and cycle facilities, bridges, buildings, recreation grounds, parks, waste disposal and water treatment schemes. The APS offers work experience opportunities for school students, internships for university students, and cadetships. Find out more about careers with the APS here, or find your state's website here.

Research and Education

At any stage during an engineering career, you can further your studies to gain a higher-level qualification with a Master's or Doctoral research degree. Combined with industry experience you can find employment:

- Teaching and researching as a university academic.
- Consulting on technical issues in your area of expertise.
- Researching and contributing to policy in the public sector.



Strengths of Engineers

Who Makes a Good Engineer?

If you've ever thought, 'there's got to be a better way', or wondered, 'why doesn't this work?', investigated and found a solution, you could be a budding engineer!

Curiosity, creativity, and problem solving skills are just some of the traits needed to become an engineer. As you learn about the different fields of engineering, think about and how each may link to your interests, the subjects you like at school, and your values - (what really matters to you in the world).

Personal Qualities



- Do you like to experiment?
- Do you have an eye for detail?
- Can you concentrate for long periods of time?
- Are you curious to understand how things work?
- Are you patient and persistent in the face of challenges?
- Do you want to help people, society, or the environment?

Academic Aptitudes

Do you enjoy science, maths, and technology subjects, and are you good at them? You will further develop knowledge and skills in these areas in an engineering course and use them daily in an engineering career.



Many institutions require prerequisites for engineering courses. Even if they don't, some may still assume you know the content taught in relevant Year 12 subjects.

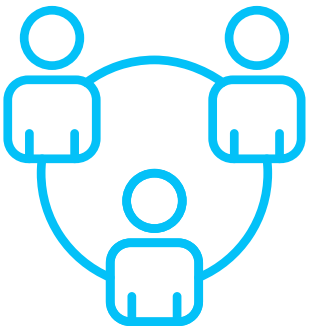
Depending on which kind of engineer you want to become, you will most likely need to select a combination of Maths (check which level you need), Physics, Chemistry, Biology, and Information Technology in Years 10 - 12 to study engineering when you finish school.

Use the Career Tools Course Search feature, (see the How to Find Courses section of this guide), to learn more about entry requirements for courses you're interested in.

Strengths of Engineers

Enterprise Skills

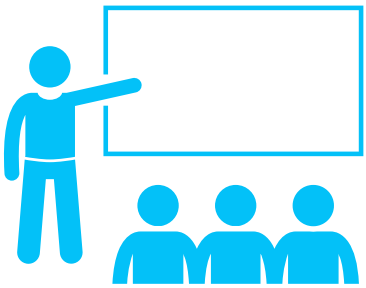
As well as technical knowledge and skills, aspiring engineers need to develop enterprise skills or 'soft skills' to be successful:



Teamwork
Engineers work on team-based projects collaborating with different kinds of engineers and other professionals.

Communication
Engineers need to write clear and accurate emails, reports, and project specifications. They listen, negotiate, and give feedback.

Presentation skills
Explaining and presenting complex information in ways those without engineering expertise understand is vital.



Creativity
Engineers need to be curious, original thinkers to develop novel solutions and bring their inventions to life.



Problem solving
Engineers use systematic strategies to help them find answers to the difficult questions and challenges they face.

Critical thinking
Engineers analyse problems from all perspectives, develop a range of solutions, and choose the best ones to pursue.

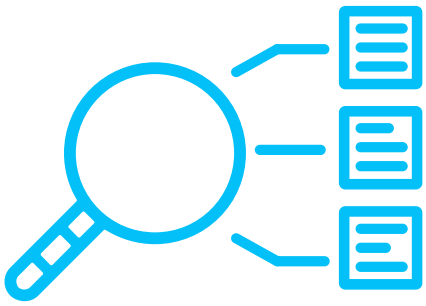
Digital literacy
Sophisticated software helps engineers manage projects, create designs, communicate, and test products.



Financial literacy
Engineers estimate and calculate costs, write budgets, design economical solutions, and ensure profitability.

Pathways to Engineering

Occupational Categories



There are three categories of qualified engineers:

- Associate
- Technologist
- Professional

Each category has specific responsibilities within their role and requires a different education and training pathway.

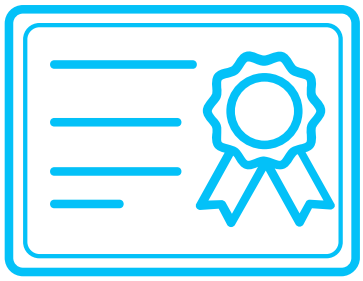
Engineering Associate

Engineering Associates design, develop, manufacture, operate, and maintain products, equipment, and processes. They perform routine tasks contributing to large, complex projects, but they may manage smaller projects under the supervision of a senior engineer.

Engineering Associates:

- Perform calculations to determine material costs and quantities.
- Assist with testing equipment, and in supervising operations and maintenance.
- Check that finished products follow specifications, regulations, and contract details.
- Produce designs, diagrams, documentation, and detailed drawings using computers.

Qualification Pathways:



- 2-year Advanced Diploma or Associate Degree.
- At a VET or combined VET/Higher Education institution.
- Can be achieved through a Cadetship.
- Provides credit towards higher qualifications.

Earn and Learn with an Engineering Cadetship:

- Paid, full time employment.
- Usually completed in 18 months to 2 years.
- Advertised by private and government employers in many areas of engineering.
- An engineering qualification with financial contributions towards your course fees.

Pathways to Engineering

Engineering Technologist

Engineering Technologists' work has a practical focus on applying others' designs to test, fabricate, construct, and carry out fieldwork. Professional Engineers are the 'problem solvers', whereas Technologists and Technicians are the 'doers' who keep things working.

Engineering Technologists:

- Work on the practical side of projects.
- Can supervise the work of other engineers.
- Apply and modify established engineering practices.
- Work with other engineers on interdisciplinary projects.



Qualification Pathway:

- 3-year Bachelor of Engineering Technology Degree.
- Studied at a VET and/or Higher Education institution.

Professional Engineer

Professional Engineers' work has a more conceptual focus than Engineering Technologists'. Professional Engineers design and create new products, systems, structures, and services that transform industries and improve lives. They have a deep understanding of their specialty and are qualified to legally sign off work and authorise developments.

Professional Engineers:

- May have leadership and management skills.
- Take environmental, community, and social issues into account.
- Focus on overall systems to solve diverse and complex problems.

Qualification Pathways:

- 4-year Bachelor of Engineering Degree.
- Studied at a Higher Education institution.

or

- 3 or 4-year Bachelor Degree in a related discipline.

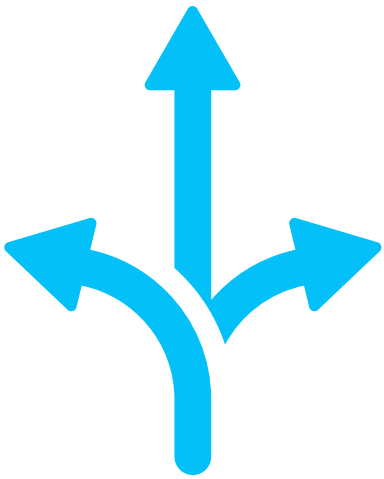
  +
- 2-year Master of Engineering.



Pathways to Engineering

Pathways from Year 12 and Beyond

You can enter any engineering course from Year 12, however, entry requirements vary by course level and institution. Check your eligibility with your Careers Advisor, and remember that only Engineers Australia accredited courses can qualify you to register as a practising engineer.



If you complete a tertiary preparation course, a VET course in a different discipline, or a Traineeship or Apprenticeship, you can apply for an Advanced Diploma or an Associate Degree of Engineering, or an Engineering Cadetship. These qualifications provide credit towards a Bachelor of Engineering if you choose to study further.

Occupational Category Pathway Summary

	Associate	Technologist	Professional
How long does it take?	2 years	3 years	4 years
What qualification do I need?	Advanced Diploma of Engineering or Associate Degree of Engineering	Bachelor of Engineering Technology Degree	Bachelor of Engineering Degree with Honours
Where do I get it?	VET institution or Combined VET/HE institution	Combined VET/HE institution or HE institution	HE institution
What are the workplace learning opportunities?	Engineering Cadetship	Internship or Industry project	Internship

Engineering Courses

Honours Degrees

Most 4-year engineering degrees include the word 'Honours' in their title meaning the course is at Level 8 of the Australian Qualifications Framework (AQF). This makes it a higher qualification than a 3-year bachelor degree which is at Level 7.



Universities structure their Honours programs differently. For example, some courses require students to complete a practical project connected to an internship, while others build the honours requirements into core subjects. This is why it's important to carefully research courses you're interested in so you know how you will learn.

An honours degree prepares you with a range of skills employers look for by demonstrating that you:

- Can manage projects.
- Have achieved high academic standards.
- Can research, analyse, and evaluate complex information.
- Are prepared to pursue further study and research at higher levels if you choose.

Engineering Internships



An internship is a type of workplace learning. Unlike work experience at school where you learn from observing and assisting, at an internship you are expected to put what you have learnt into practice and make meaningful contributions. Internships are:

- Unpaid or paid, depending on the employer.
- Usually equivalent to 10 - 12 weeks of full time work.
- A compulsory requirement to graduate from your course.
- Often in the final year of your degree but can be earlier.

Choosing an Engineering Course

How to Find Courses



You can explore VET and Higher Education courses for each occupational category using the Career Tools Course Search feature in the student secure area of your school's careers website.

You will find the most detailed information about engineering courses and the subjects you study within them directly on institutions' websites.

If you're considering applying for a course, it's important to visit the institution on their open day and speak to the course representatives to find out exactly what's involved.

Use each state's Tertiary Admission Centre (TAC) course search function to find and apply for courses and ensure your shortlist meets the following criteria.

What to Look for in Courses



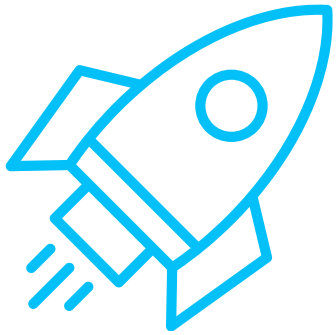
- Engineers Australia accredited courses ensure you meet the required standards to practise engineering upon graduation.
- Work Integrated Learning (WIL) provides opportunities for you to apply what you're learning to real-world scenarios and prepares you for the workforce.
- Industry partnerships with organisations whose projects align with your interests and the type of work you'd like to do.
- General engineering degrees are a great option if you're not sure which area of engineering you want to pursue. They offer a taste of different areas in the first year, allowing you to choose your major/s in your second year.

Note:
In the next section, not all areas of engineering have accredited courses for every occupational category. You will see 'N/A' where this is the case.

Areas of Engineering

Aerospace

Aerospace Engineers help make air and space adventures a reality by using the principles of physics, maths, and aerodynamics to design, develop, manufacture, maintain, and modify aircraft and spacecraft.



Aerospace Engineers may specialise as either:



- Aeronautical Engineers who work with aircraft operating within Earth's atmosphere, such as gliders, fixed-wing airplanes and jets, autogyros, and helicopters.
- Astronautical Engineers who focus on the science and technology of spacecraft and launch vehicles like satellites, space capsules, planetary probes, missiles, and rockets.

Study Pathways

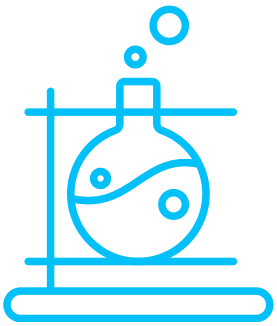
	Aerospace	Aeronautical
Associate	2-year Advanced Diploma or Associate Degree with an Aerospace major	2-year Advanced Diploma with an Aeronautical major
Technologist	N/A	3-year Bachelor of Technology with an Aeronautical major
Professional	4-year Bachelor of Engineering (Honours) with an Aerospace or Aeronautical major (may be offered with Electrical or Mechanical majors) or 3-year bachelor degree in a related discipline + a 2-year Master of Aerospace Engineering	

Areas of Engineering

Biomedical

If you've had an X-ray or ultrasound, or you know someone with dentures, an artificial limb, or a pacemaker, then you're aware of some ways Biomedical Engineers help people to live better lives.

Biomedical Engineers combine medicine, biology and molecular biology with electronic, electrical, mechanical, chemical and materials engineering to advance medical and healthcare technologies and treatments.



Biomedical Engineers may specialise as:



- Tissue Engineers who create materials to augment or repair human tissue.
- Rehabilitation Engineers who create devices that improve quality of life for people with disabilities.
- Clinical Engineers who develop instruments and equipment for medical staff.
- Bio Engineers who apply engineering principles to biological systems and processes.

Study Pathways

Associate	2-year Associate Degree in Biomedical Engineering
Technologist	N/A
Professional	4-year Bachelor of Engineering with a Biomedical major or 3-year bachelor's degree in a related discipline (may require specific prerequisites) + 2-year Master of Biomedical Engineering (may be offered with Chemical or Electrical Engineering majors)

Areas of Engineering

Chemical

The foods we eat, the water we drink, and the clothes we wear are just some of the everyday items that Chemical Engineers help produce. Next time you reach for your toothpaste, or any other household product, a glance at the ingredients list will give you an insight into the complex world of chemical engineering!



Chemical Engineers combine physics and chemistry with microbiology and biochemistry to transform chemicals into the materials and products we take for granted.

As a Chemical Engineer, you could specialise in:

- Bioprocessing of foods, drinks, and pharmaceuticals.
- Petroleum which involves the production of oil, gas, and LPG.
- Combustion involving industrial furnaces used to generate power.



- Process Control of systems to ensure manufacturing runs efficiently.
- Chemical Processing of fertilisers, caustic soda, glass, and explosives.
- Mineral processing of aluminium, steel, copper, lead, uranium, and gold.
- Petrochemical conversion of oil and gas into plastics and other synthetics.

Areas of Engineering

Chemical Engineering Study Pathways

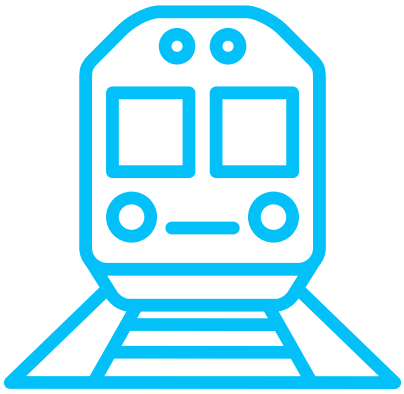
Associate	2-year Advanced Diploma of Process Plant Technology
Technologist	N/A
Professional	4-year Bachelor of Engineering with a Chemical major or 3-year bachelor degree in a related discipline + 2-year Master of Chemical Engineering (may be offered with Metallurgical (metal), Petroleum, Process, Materials, Environmental, Biomedical, Bioprocess, or Bimolecular majors)

Areas of Engineering

Civil

The road or railway you travelled on to school today is the work of Civil Engineers who plan, design, and construct our built environment using the principles of design, maths, and science.

Their work is present in bridges, drainage systems, pipelines, towers, harbours, and airports.



Civil Engineers contribute to a more sustainable future by protecting and restoring the natural environment in their designs.



Civil Engineers may specialise to become:

- Airport Engineers who prepare designs for airports, hangars and control towers.
- Geotechnical/Soil Engineers who prepare soil mixtures for use in roads, embankments and other constructions.
- Harbour Engineers who design harbour facilities such as breakwaters, jetties, wharves, heavy-duty pavement surfaces, cargo sheds and more.
- Highway Engineers who analyse traffic patterns, design traffic systems, roadways and embankments, and more.
- Hydraulic/Water Resources Engineers who design water resource facilities such as dams, aqueducts, hydro-electric plants, drainage and sewerage systems.
- Irrigation/Drainage Engineers who test, measure and analyse the characteristics of soil, such as salinity, soil type and surface profile.
- Structural Engineers who ensure the stability, strength and rigidity of buildings, bridges, frameworks, and footings.

Areas of Engineering

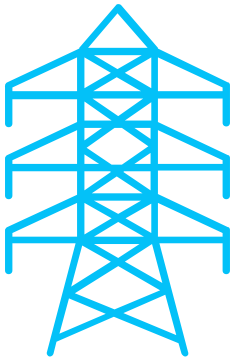
Civil Engineering Study Pathways

Associate	2-year Advanced Diploma of Civil Engineering Design or Associate Degree of Civil Engineering (may be offered with Design/Drafting, Management, Site Management, Structural majors)
Technologist	3-year Bachelor of Technology or Bachelor of Engineering Science with a Civil Engineering major (may be offered with a Structural major)
Professional	4-year bachelor's degree with a Civil Engineering major (may be offered with Architectural, Construction, Construction Management, Design, Environmental, Humanitarian, Infrastructure, Mining, Petroleum, Structural majors) or 3-year bachelor's degree in a related discipline + 2-year Master of Civil Engineering (may be offered with Construction, Environmental, Infrastructure, Management, Structural)

Areas of Engineering

Electrical

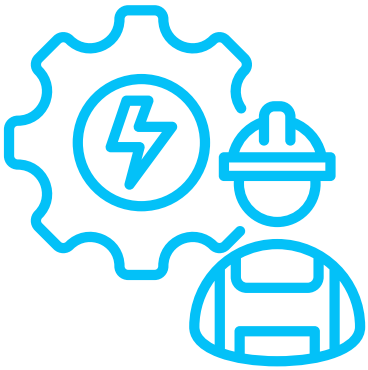
The world would be a pretty dark place (literally!) without Electrical Engineers who illuminate, power, and connect us. From shaping the future with A.I. to harnessing sustainably sourced power, Electrical Engineers contribute to essential services like transport, water, and healthcare by developing ways to generate, transmit, and distribute the electricity we rely on.



Electrical Engineers:

- Develop products like electric motors, components, and appliances.
- Design and install control and signalling equipment for road, rail, and air traffic.
- Design and maintain machines that generate steam, power, heat, and refrigeration.

There are 3 main types of engineers within this area of engineering:



- Electrical Engineers who design and manage the electrical systems used in automation, surveillance, energy conversion and power distribution.

- Telecommunications Engineers who explore the ways information is collected and distributed and work with communications technologies such as optical fibre, wireless systems like 5G and WiFi, cable systems, and satellite communications.

- Electronics Engineers who focus on small-scale electronic systems, such as computers and integrated circuits. They design, develop, adapt, install, test, and maintain electronic components used for computer and communication systems, entertainment, medical devices, radar and navigation, white goods and more.

Areas of Engineering

Electrical Engineering Study Pathways

Associate	2-year Advanced Diploma of Electrical Engineering or Associate Degree of Engineering with an Electrical major (may be offered with Electronics major)
Technologist	3-year Bachelor of Engineering Technology or Science with an Electrical major (may be offered with Electronics major)
Professional	4-year Bachelor of Engineering with an Electrical major (may be offered with Data Analytics, Information Processing, Electronics, Power, Renewable Energy, Computer Systems, Aerospace, Mechatronics, Telecommunications, Sports majors) or 3-year bachelor's degree in a related discipline + 2-year Master of Electrical Engineering (may be offered with Electronics, Embedded Systems, Computer, Systems, Biomedical majors)

Telecommunications Engineering Study Pathways

Associate	N/A
Technologist	3-year EA accredited Bachelor of Engineering Technology with a Telecommunications major
Professional	4-year EA accredited Bachelor of Engineering with a Telecommunications major (may be offered with Computer or Electrical majors) or 3-year bachelor's degree in a related discipline + 2-year EA accredited Master of Telecommunications Engineering (may be offered with Network Engineering)

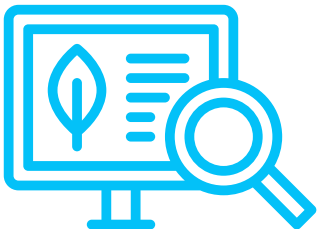
Areas of Engineering

Electronics Engineering Study Pathways

Associate	2-year Advanced Diploma of Electronics and Communications Engineering or Associate Degree of Engineering Technology with an Electronics major
Technologist	3-year Bachelor of Engineering Science with an Electronics major (may be offered with an Electrical major)
Professional	4-year Bachelor of Engineering with an Electronics major (may be offered with Electrical or Communications majors) or 3-year bachelor's degree in a related discipline + 2-year Master of Electronics Engineering (may be offered with Telecommunications or Communications majors)

Areas of Engineering

Environmental



As an Environmental Engineer, you could work on solutions to the world's most important challenges such as helping to solve climate change, ensuring equitable water supply, or restoring natural ecosystems.

Environmental Engineering combines aspects of Civil and Chemical Engineering with biological sciences to:

- Improve recycling.
- Improve public health.
- Preserve the environment.
- Minimise water, soil and air pollution.



Environmental Engineers are involved in a wide variety of activities such as:

- Contributing to environmental policies.
- Designing processes to treat waste and recycling.
- Conducting environmental risk and impact assessments.
- Managing and controlling pollution and contaminated land.
- Designing and developing sustainable and renewable energies.

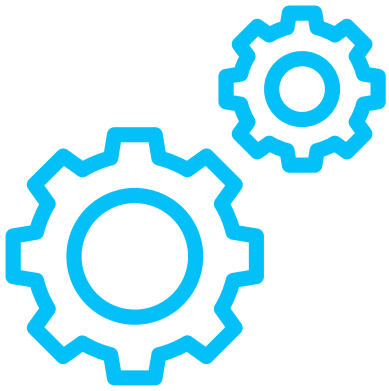
Study Pathways

Associate	N/A
Technologist	3-year Bachelor of Engineering Science with an Environmental major
Professional	4-year Bachelor of Engineering with an Environmental major (may be offered with Civil, Structural, or Mining majors) or 3-year bachelor's degree in a related discipline + 2-year Master Environmental Engineering (may be offered with Civil, Structural, or Mining majors)

Areas of Engineering

Mechanical

Imagine life without a fridge, car, or washing machine! These are just some of our everyday inventions that Mechanical Engineers help design.



Mechanical Engineering includes the design, development, manufacture, installation, testing, operation and maintenance of machinery, mechanical systems, automated systems, and thermodynamic and combustion systems.

But in simple terms, Mechanical Engineering is the study of objects and systems in motion.

As a Mechanical Engineer, you could specialise as an:

- Automotive Engineer who designs and manufactures vehicles, such as motorcycles, automobiles, buses, trucks, and their subsystems.
- Building Services Engineer who designs and develops the inner workings of buildings to provide safe and functional environments.
- Construction Engineer who plans and manages the construction highways, bridges, airports, railroads, buildings, dams, and reservoirs.



- Manufacturing Systems Engineers who design and improve systems and equipment that complete tasks accurately and efficiently.
- Mechanical Design Engineer who designs new machines, equipment, and systems.
- Mining Engineer who plans and directs the engineering aspects of extracting resources from the Earth.

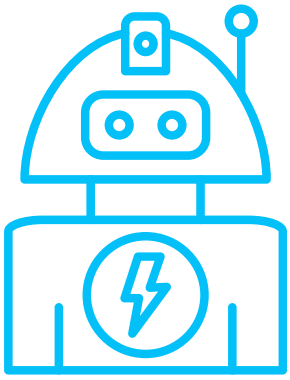
Areas of Engineering

Mechanical Engineering Study Pathways

Associate	2-year Advanced Diploma of Engineering Technology or Associate Degree of Engineering with a Mechanical major
Technologist	3-year Bachelor of Engineering Science or Technology with a Mechanical major (may be offered with a Manufacturing major)
Professional	4-year Bachelor of Engineering with a Mechanical major or (may be offered with Aerospace, Manufacturing, Materials, Mechatronic, Mining, Petroleum, Sports, Sustainable Energy majors) or 3-year bachelor's degree in a related discipline + 2-year Master of Mechanical Engineering (may be offered with a Management)

Areas of Engineering

Mechatronics



MECHAnical + elecTRONIC = Mechatronics Engineering! Although it involves software engineering too.

If you like ICT and the sound of Mechanical and Electronic Engineering, this could be the specialisation for you as it integrates mechanics, electronics, robotics, computing, and telecommunications.

Mechatronics Engineers design, build, operate and maintain machinery with electronic and computer control systems such as those found in:



- Robotics
- Nanotechnology
- Smart infrastructure
- Communication networks
- Motor vehicles
- Bioengineering
- Mining machinery
- Aerospace and avionics

Study Pathways

Associate	2-year Advanced Diploma or Associate Degree of Engineering with a Mechatronics major (may be offered with a Robotics major)
Technologist	3-year Bachelor of Engineering Science or Technology with a Mechatronics major (may be offered with a Robotics major)
Professional	4-year Bachelor of Engineering with a Mechatronics major (may be offered with a Robotics major) or 3-year bachelor's degree in a related discipline + 2-year Master of Mechatronics Engineering

Get Yourself Involved

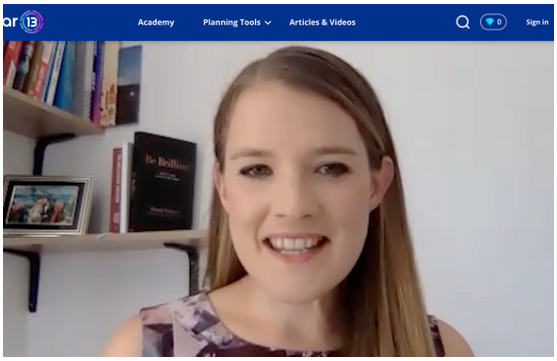
Engineers Australia Quiz

From giant space telescopes to tiny robots, engineers have changed the world. But how much do you know about this fascinating subject?

Take this Engineers Australia Quiz to find out!



Year 13 Engineering your Future Webinar



Year 13 talks to Felicity Furey, a professional engineer and industry leader.

In this 30-minute webinar, Felicity leads a panel of engineering students, graduates and professionals, tapping into their stories of how they got into engineering and what they wish they knew in school.

Year 13 x Engineers Australia Academy

The Year 13 Academy is a free online learning tool that rewards you with money and prizes! Year 13 and Engineers Australia show you what it's really like being an engineer, how to get started, and the exciting projects you could work on in the future.

The Academy is made up of 4 modules with 3 topics in each:

1. Designing Your Future
2. Customise Your Career
3. Getting into Gear
4. The Building Blocks



They only take a few minutes, so check them out when you have some spare time in class.

Get Your School Involved

F1 in Schools

The World's Most Competitive STEM Competition involves over 17,000 schools in 51 countries. In Australia, approximately 22,000 students participate each year.

Students design, make, and race a miniature F1 car capable Of 0-80 Km/H in under 1 second!

Mimicking the world of a Formula One team, groups of students follow a pathway of engineering and manufacturing disciplines: design, analyse, test, make, and race.

They get access to real-world technology such as 3D CAD/CAM/CAE engineering design software and become proficient in Coding, Computational Fluid Dynamics, and Finite Element Analysis.

This program develops skills in problem solving, project management, communication, presentation, teamwork, innovation, self-promotion, collaboration, marketing, and entrepreneurialism which aid students in their transition through high school and into employment.

If you're interested in running F1 in Schools at your school, this introductory overview explains what it's about and how you can start running it.

The Power of Engineering



The Power of Engineering brings together universities and the engineering industry to provide practical and creative experiences for Year 9 and 10 girls in one-day workshops prior to subject selection.

The workshops provide girls with a better understanding of engineering and demonstrate to them that they have the power to change the world. Learn about their workshops and other resources here.

Get Your School Involved

Robogals

Robogals is an international not for profit organisation that aims to inspire, engage and empower young women into engineering to create a globally diverse and inclusive culture.

Robogals has over 30 chapters across the globe in over 10 different countries. In Australia, it operates in the ACT, NSW, QLD, TAS, VIC, and WA.

A network of university student volunteers deliver the interactive Robogals workshops for primary and secondary school girls to encourage them to cultivate interest and self-confidence in STEM.

Glossary

Academia	Is a broad name for the field of work university researchers and teachers are employed in.
Australian Defence Force (ADF)	The ADF is made up of the Air Force, Army, and Navy, and is a major employer in Australia.
Australian Defence Force Academy (ADFA)	Located in Canberra, the ADFA is a special campus of The University of New South Wales. It is for people in the Air Force, Army, or Navy to get their university qualifications.
Australian Public Service Jobs (APS)	People who work for the APS are employed by Local State, or Federal government organisations. The APS offers roles in Australia and overseas and has apprenticeship, Indigenous, school leaver and graduate programs.
Australian Qualifications Framework (AQF)	The AQF governs Australian qualifications. They set the rules about the kind of content a course must offer and the knowledge and skills a graduate must have, from a Certificate I level to a PhD level.
Core subjects	Are compulsory subjects, whereas elective subjects are ones you choose.
Graduate Engineers	You are considered a Graduate Engineer for your first three years of full-time work after completing your engineering course.
Institutions	Are educational providers such as universities, TAFEs, and private colleges.
Interdisciplinary	Means people with different qualifications and areas of expertise come together to work on a project. An example of an interdisciplinary project in engineering might involve Structural, Civil and Building Services Engineers working with Architects, Builders, and Government Officials on a large construction project.
Major/s	A major is the subject area you specialise in throughout your degree. While you may only study some subjects in the first and second years of your degree, you will study subjects from your major/s from your first to your final year. Degrees with single majors will likely provide more opportunity to choose electives, whereas degrees with double majors will have more core or compulsory subjects.

Glossary

Mean	Is another word for average. It is calculated by adding the reported salaries together and then dividing them by the number of salaries that were reported.
Median	Is the salary that falls in the middle of all reported salaries. It means that 50% of salaries are lower than or equal to the median and 50% of salaries are higher than or equal to the median.
Prerequisites	Are subjects you must have studied and passed (often with a certain result), either at school or university to gain entry into a certain program. For example, Year 12 English and Maths are prerequisites for entry into most engineering degrees. At university, it might be a prerequisite that you maintain a 75% average in your results to continue into a master's degree program.
Remuneration	Is the money and other benefits (e.g. a car, bonuses etc.) someone is paid for their work.
Salary / Salaries	A person's salary is the income they earn from their employer, expressed as an annual (yearly) amount before tax. For example, a Graduate Engineer might start on a salary of $70,000 per year but this will increase as they gain experience.
Tertiary Admission Centre (TAC)	TACs receive and process applications for admission to courses on behalf of tertiary institutions in each state and territory: • ACT/NSW - UAC • QLD - QTAC • SA/NT - SATAC • TAS - Directly to the institution • VIC - VTAC • WA - TISC