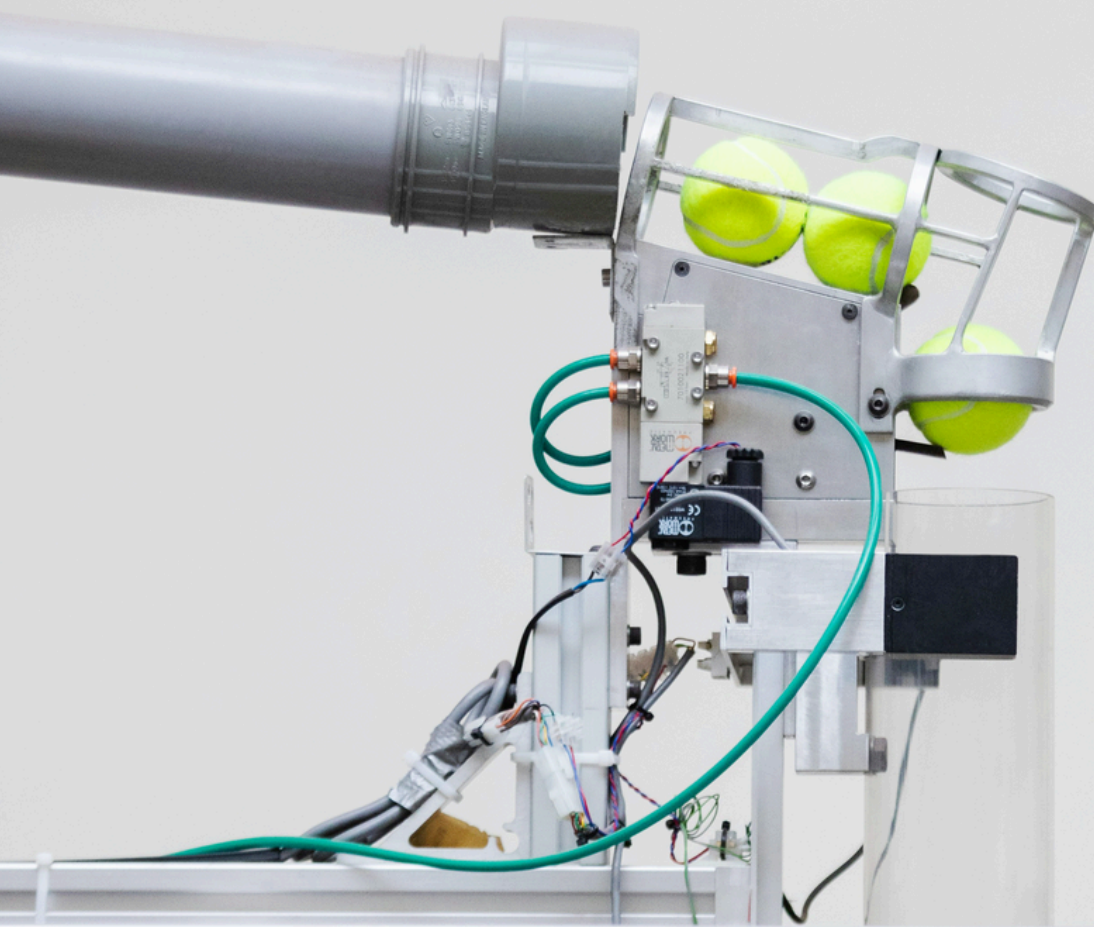




Guide to Engineering Careers



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Areas of Engineering

Dive into 16 areas of engineering and their specialisations:

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How to Get Started

Immerse yourself in the world of engineering

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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 2025 © Career Tools

What is Engineering?



Clever Creators

What do WiFi, the Cochlear hearing implant, the Sydney Opera House and Harbour Bridge, and the Black Box have in common? They are world-changing feats of engineering created right here in Australia!

Engineers Australia (EA), the peak body for the engineering profession, recognises 16 distinct areas of engineering and accredits 40 different types of courses. This diversity makes it challenging to define what engineering encompasses in simple terms, 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.



Whether your dream is to clean the world's oceans, design safe transport, or harness renewable energy, choosing engineering means choosing to make a real difference.



Explore the skills, pathways, and opportunities in engineering careers through this guide, created in partnership with Engineers Australia.



ENGINEERS
AUSTRALIA

Who Makes a Great Engineer?



Personal Qualities

Do you often think, 'there must be a better way' or enjoy understanding how things work? Engineering might be your calling. Engineers are curious problem solvers who create solutions to complex challenges.

Essential qualities include:

Curiosity and creativity: Engineers use innovative thinking to solve complex problems and design solutions that improve lives.

Strong analytical skills: Engineering work requires critical thinking and data analysis to ensure systems are efficient, effective, and safe.

Attention to detail: Precision matters; engineers must carefully test and refine their work to ensure reliability and safety.

Persistence and adaptability: Engineering challenges often require perseverance and the flexibility to adjust ideas when things don't go as planned.

A passion for helping others and improving the world: At its core, engineering is about making the world better — whether through technology, infrastructure, or sustainability.

Academic Aptitudes

Do you enjoy science, maths, and technology subjects, and are you good at them? Depending on the kind of engineer you want to become, you might need to study a combination of these Year 12 subjects:

- Maths (check which level)
- Physics
- Chemistry
- Biology
- Information Technology

Courses may list **prerequisites** (subjects you must study to apply) or **assumed knowledge** (subjects you're expected to be familiar with). Unlike prerequisites, assumed knowledge subjects are not mandatory but can significantly help you succeed in the course.



Who Makes a Great Engineer?

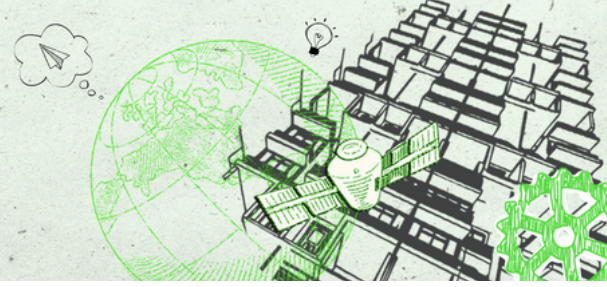


Enterprise Skills

As well as technical knowledge and skills, engineers need enterprise skills for success. For example, great engineers use:



Life as an Engineer



Office Engineer vs Site-Based Engineer

HOURS

Engineering roles vary in working hours depending on the sector. For example, office-based engineers typically work Monday to Friday during business hours whereas site-based engineers might work rotational schedules, such as two weeks on-site and two weeks off.



ENVIRONMENT

Engineers work in diverse environments and can be based in offices, construction sites or laboratories in metro areas, regional or remote locations, including offshore! Travelling for projects or to aid humanitarian efforts are great opportunities for engineers to broaden their experiences.



DIVERSITY

Diversity fuels innovation. When teams become more diverse in gender, background and thought, performance and innovation follow. Engineering needs people from different backgrounds to broaden thinking when solving problems.



EARNING

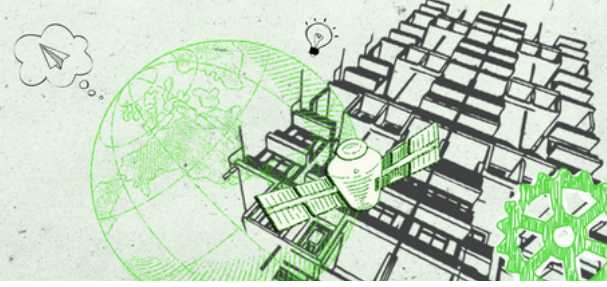
Engineering salaries (pay) are among the highest across professions in Australia, reflecting the critical skills and expertise required.

The salaries throughout this guide are from the [Professional Engineers Employment and Remuneration Report 2024](#), which provides data for professional engineers (those with a 4-year qualification and higher). [Mercer](#) and [Hays](#) wage data has also been used to provide additional insight, particularly into graduate starting salaries.

Use these figures as a guide only, as the amounts will likely change by the time you enter the workforce.



Life as an Engineer



Engineer Your Career

Career growth in engineering is dynamic, with opportunities to extend your expertise through postgraduate study and industry certifications.

“

Demand for engineering expertise is rising – career progression includes movement into leadership roles, executive management, and consulting. ”

A great benefit of the engineering profession is the opportunity to progress into leadership and business-oriented positions, such as:

ENGINEERING MANAGERS

Leading technical teams and overseeing projects.

PROJECT MANAGERS

Directing large-scale infrastructure, technology, and industrial projects.

ENTREPRENEURS AND BUSINESS OWNERS

Creating their own consulting firms or tech ventures.

SPECIALIST ROLES

Influencing regulations and cutting-edge innovation by working in public policy or research.

Life as an Engineer



Industries and Employers

Engineers work across many industries and their job roles vary enormously. Below is an overview of key industries and some example employers:

Engineers Employed	Industry/Sector	Example Employers
Aerospace, Electrical, Mechatronics, Naval Architecture	Aviation, Defence, Maritime	BAE Systems , Boeing Defence Science Technology Group
Chemical, Civil, Environmental, Mechanical, Petroleum	Minerals, Mining, Oil, Gas	Orica , BP , Origin Energy , ExxonMobil
Civil, Electrical, Environmental, Mechanical	Infrastructure, Construction, Water, Waste	AECOM , Arup , Laing O'Rourke , Tetra Tech , WSP
Biomedical, Chemical, Mechanical	Biomedicine, Health Services	Cochlear , Compumedics , Device Technologies , Therapeutic Goods Administration
Electrical, Mechatronics, Robotics	Automation, Telecommunications	Google , IBM , Microsoft , Nokia , Ericsson , NEC , Siemens , Telstra

Government Employers

The [Australian Defence Force](#) (ADF) employs engineers for infrastructure, vehicles, and equipment. Students can join through ADFA or Defence University Sponsorship.

The [Australian Public Service](#) (APS) employs engineers for public projects such as bridges, water treatment, and transport infrastructure. The APS offers work experience, internships, and cadetships.

Engineers can advance their qualifications through Master's or Doctoral degrees, leading to careers in research, education: academia, consulting, or public policy development.

Pathways to Engineering



Occupational Categories

There are three categories of qualified engineers. Each has its own education and training pathway and results in different role responsibilities:

	Associate	Technologist	Professional
What do I work on?	Supporting technical aspects of engineering projects	Applying engineering principles to solve practical problems	Designing, innovating, and leading complex engineering projects
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
How long does it take?	2 years	3 years	4 years
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

Internships are type of workplace learning that provides the opportunity to apply your skills in real-world settings. They are generally 10-12 weeks and may be paid or unpaid. They are often a requirement to graduate from your degree.

Cadetships are paid, full-time roles combining work and study and typically lasting 18 months to 2 years.

Higher Education Apprenticeships are a study-and-work program that lets you earn a university degree while getting paid work experience at the same time.

Choosing an Engineering Course



How to Find Courses

1

Explore VET and Higher Education engineering courses using the [Good Universities Guide](#) website. Filter your search by state and level of study to return the best results.

2

Use your state's Tertiary Admission Centre website to research course options:

- NSW & ACT: [UAC](#)
- Victoria: [VTAC](#)
- Queensland: [QTAC](#)
- South Australia and the Northern Territory: [SATAC](#)
- Western Australia: [TISC](#)
- Tasmania: [UTAS](#)

3

Find detailed course and subject information on institutions' websites, visit their open days and speak to the course representatives.

What to Look for in Courses

ACCREDITATION:

Ensure you choose an Engineers Australia accredited course, so you meet the required standards to practise engineering when you graduate.

WORK INTEGRATED LEARNING (WIL)

Look for institutions offering practical experience with industry partnerships aligned with your interests.

FLEXIBILITY:

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 in your second year.

Earning Potential



Starting Out as a Grad Engineer

Engineering graduates in Australia enjoy competitive starting salaries, with recent [Mercer](#) and [Hays](#) data showing a median of around \$71,500. This places engineering among the top five highest-earning fields for new graduates. The [2024 Professionals Australia Remuneration Survey](#) further shows that graduate engineers (Level 1) earn a median base salary of \$83,400, rising steadily with responsibility to \$190,000 for senior engineers (above Level 4).

Salary Growth in the First 5 Years

As engineers gain experience, their salaries typically increase significantly. While specific figures can vary, mid-level engineers with 5–10 years of experience often see salaries ranging from \$102,000 to \$120,000, with senior engineers earning even more.

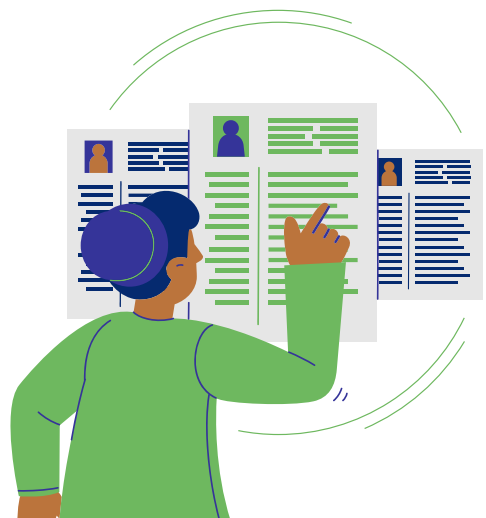
Projected Trends

Engineering salaries in Australia have been experiencing steady growth, reflecting strong demand across various sectors. In fact, according to the [2024 Professional Engineers Remuneration Report](#), engineering wages across both private and public sectors grew by 3.9%

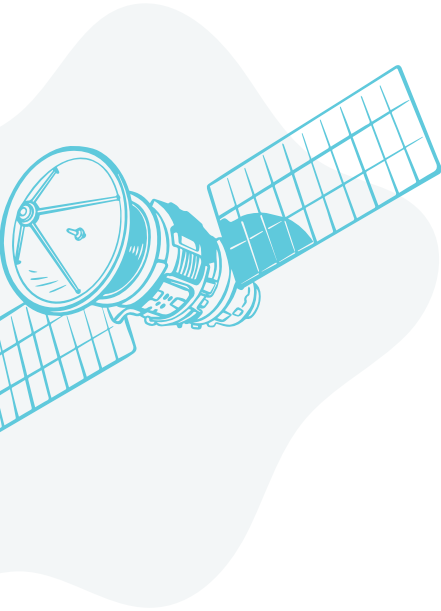
NOTES

Engineering salaries can vary based on several factors, including the specific sector (e.g., civil, mechanical, electrical), level of responsibility, employer size, geographic location, and years of experience.

It's essential to research the particular engineering field you're interested in to understand potential earnings.



Areas of Engineering



Aerospace

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

Specialisations:

Aeronautical Engineers work with aircraft operating within Earth's atmosphere, such as jets, helicopters, and gliders.

Astronautical Engineers focus on spacecraft and launch vehicles like satellites and rockets.

Building Services

Building Services Engineers ensure that buildings provide a comfortable, safe, and efficient environment by designing and managing systems such as ventilation, heating, cooling, lighting, and water supply.

Specialisations:

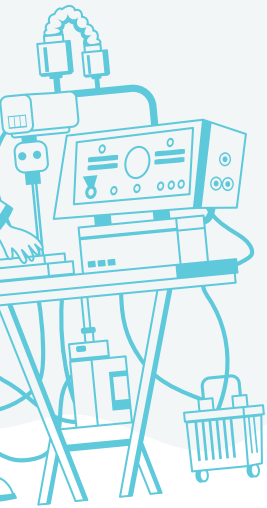
Mechanical Services Engineers focus on heating, ventilation, and air conditioning systems.

Electrical Services Engineers design power supply and lighting systems.

Public Health Engineers develop water and drainage systems for buildings.



Areas of Engineering



Biomedical

Biomedical Engineers combine medicine, biology, and engineering to advance healthcare technologies.

Specialisations:

Tissue Engineers create materials to augment or repair human tissue.

Rehabilitation Engineers design devices that improve quality of life for people with disabilities.

Clinical Engineers develop instruments and equipment for medical staff.

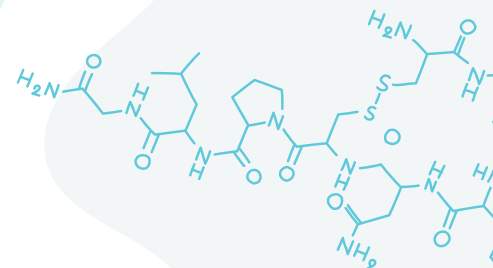
Chemical

Chemical Engineers combine principles of physics, chemistry, and biology to transform raw materials into valuable products like fuels, medicines, and materials. They also work on processes to improve efficiency and sustainability in manufacturing.

Specialisations:

Process Engineers optimise chemical processes in industries like oil and gas or food production.

Biochemical Engineers work with biological systems to produce pharmaceuticals, biofuels, and other bioproducts.



Areas of Engineering



Civil

Civil Engineers design, build, and maintain infrastructure that shapes our modern world, from roads and bridges to water supply systems.

Specialisations:

Transportation Engineers plan and develop systems for efficient travel and transport.

Water Resources Engineers design and manage water supply and wastewater treatment systems to ensure sustainable use of resources.

Municipal Engineers plan and oversee urban infrastructure, such as roads, drainage systems, and public utilities.

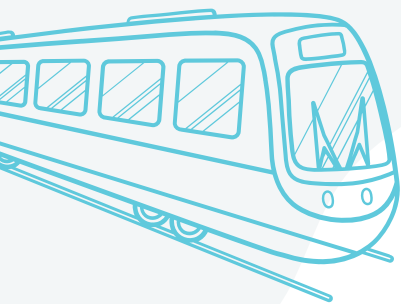
Electrical

Electrical Engineers design and develop electrical systems essential to power generation, automation, and industrial applications.

Specialisations:

Power Engineers work on electricity generation and distribution systems.

Instrumentation Engineers design and maintain control and monitoring systems used in industrial and electrical applications.



Areas of Engineering



Environmental

Environmental Engineers address environmental challenges like pollution, climate change, and resource management by combining engineering with ecological principles.

Specialisations

Sustainability Engineers develop renewable energy systems and sustainable practices.

Ecological Engineers work on projects such as wetland restoration, pollution control, and land management.

Air Quality Engineers create solutions to reduce emissions and improve air quality.



Fire Safety and Fire Systems

Prevent, reduce, and manage fire risks. **Fire Safety Engineers** design fire prevention strategies while **Fire Systems Engineers** specialise in the design, installation, and maintenance of fire suppression and detection systems like sprinklers, alarms, and emergency response systems.

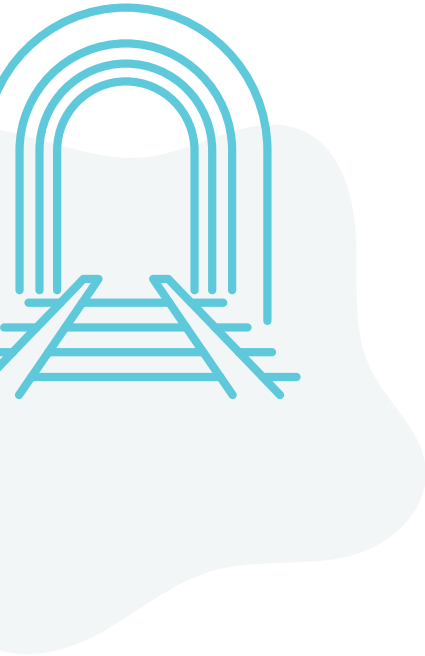
Specialisations:

Risk Assessment Engineers conduct hazard analyses and create strategies for fire prevention and emergency response.

Structural Fire Safety Engineers design buildings with fire-resistant materials to comply with safety codes.



Areas of Engineering



Geotechnical

Geotechnical Engineers analyse soil, rock, and groundwater conditions to ensure the stability of infrastructure projects such as buildings, roads, and tunnels.

Specialisations:

Foundation Engineers design deep and shallow foundations for structures.

Slope Stability Engineers assess and prevent landslides and erosion.

Tunneling Engineers design and construct tunnels and underground spaces while ensuring stability and safety.

Information, Telecommunications and Electronics

These engineers work on developing communication networks, electronic devices, and cybersecurity systems.

Specialisations:

Network Engineers design and maintain internet and telecommunications networks.

Electronics Engineers design circuits and components for telecommunications, computing, and embedded systems.

Cybersecurity Engineers create secure communication systems.



Areas of Engineering



Mechanical

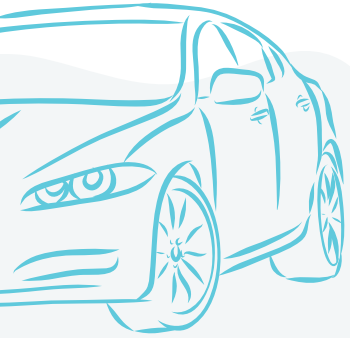
Mechanical Engineers design, build, and maintain mechanical systems and devices, ranging from engines to manufacturing equipment.

Specialisations:

Automotive Engineers develop and improve vehicles and their components.

Construction Engineers plan and manage the construction highways, bridges, airports, railroads, buildings, dams, and reservoirs.

Manufacturing Engineers optimise production processes, develop automation systems, and improve the efficiency of machinery.



Mechatronics

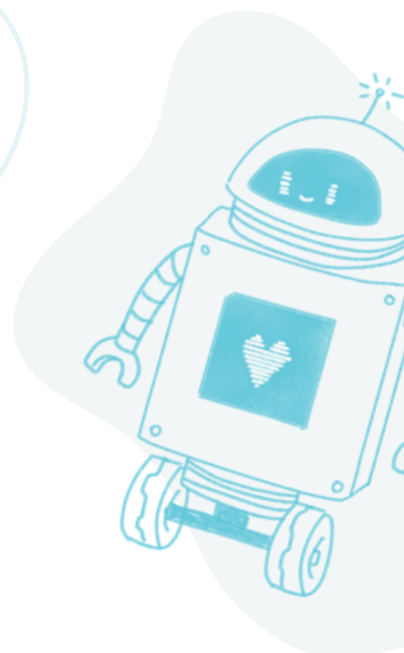
Mechatronics Engineers combine mechanical, electronic, and software engineering to develop advanced systems like robots and automated machines.

Specialisations:

Robotics Engineers work on the design and integration of robotic systems.

Control Systems Engineers develop systems to automate machinery and processes.

Smart Systems Engineers innovate in areas like IoT-enabled devices and intelligent systems.



Areas of Engineering



Naval Architecture

Naval Architecture Engineers design, build, and maintain ships, submarines, and offshore structures.

Specialisations

Hydrodynamics Engineers focus on the movement of vessels through water.

Marine Structural Engineers ensure ships are built for strength and durability.

Offshore Engineers work on platforms and floating structures.



Petroleum

Petroleum Engineers design and develop methods for extracting oil and gas efficiently and sustainably.

Specialisations:

Reservoir Engineers analyse underground reserves to optimise extraction.

Drilling Engineers design and oversee drilling operations.

Production Engineers improve extraction processes and manage facilities.



Areas of Engineering



Software

Software Engineers design, build, and maintain computer programs, apps, and systems that help people and businesses in everyday life.

Specialisations:

FrontEnd: create the parts of websites and apps you see and use, like buttons, layouts, and menus.

Backend Developers build the behind-the-scenes systems, like databases and servers.

DevOps Engineers: manage how software is tested, updated, and released.



Structural

Structural Engineers ensure that buildings, bridges, and other structures can withstand loads and environmental conditions.

Specialisations:

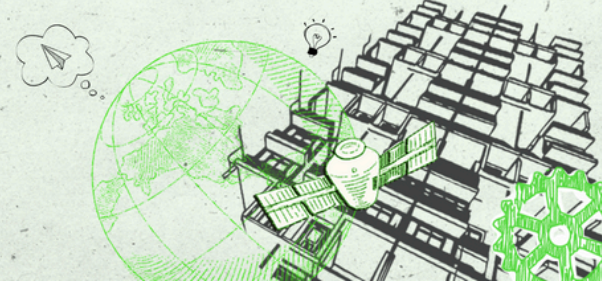
High-Rise Structural Engineers design skyscrapers and multi-story buildings.

Bridge Engineers develop safe and durable bridges.

Seismic Engineers focus on earthquake-resistant design.



How to Get Started



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 the [Engineers Australia Quiz](#) now to find out!



Year 13 Engineering Panel Webinar

This [panel webinar](#) features [Felicity Furey](#), a professional engineer and industry leader alongside a panel of engineering students, graduates and professionals.

Year13 taps into the stories of how they got into engineering and what they wish they knew in school.



Award-winning Business Leader. Engineer. Entrepreneur. Aspiring Aviator.

Year 13 Engineering Your Future Academy

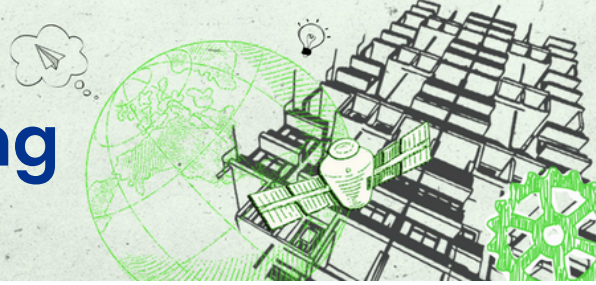
[Year 13 and Engineers Australia](#) show you what it's really like being an engineer, how to get started, and the exciting projects you could work on in the Engineering Your Future Academy.

Check out these modules now:

- Designing Your Future
- Customise Your Career
- Getting into Gear
- The Building Blocks



The Future of Engineering



Emerging Technologies

Engineers are at the forefront of advancements in cutting-edge technologies that are reshaping industries globally and in Australia. For example:



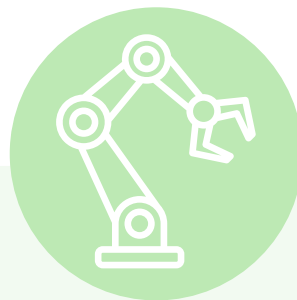
Quantum Computing:

Enables quantum-secure communications and rapid problem-solving in fields like finance and defence.



Renewable Energy:

Engineers design systems like wind turbines and solar farms to transform the nation's energy landscape and reduce fossil fuel dependency.



Robotics and AI:

These technologies are improving industries from mining to healthcare, with Australian companies like the CSIRO pioneering robotic and AI innovations.

Growth and Demand

With the global population increasing and society becoming more complex, the demand for engineers is rising. Engineers play a critical role in ensuring adequate infrastructure, healthcare, and technology, creating abundant employment opportunities in Australia and worldwide.

As innovators and problem-solvers, engineers will continue to drive progress, tackling global challenges and improving lives.

Whether designing the future of energy or harnessing quantum technologies, engineers are essential to shaping a better tomorrow and there's never been a better time to explore a career in engineering!