

Engineer Your Career Information

Overview

Historically, mainstream engineering is divided into the four broad disciplines of chemical, civil, electrical and mechanical engineering. Today, we are seeing the emergence of new disciplines of engineering. For a description of some of the major emerging fields of engineering '[Click Here](#)'

Engineers are categorised into three streams according to their qualification.

These categories are:

Trade Engineering: These engineers have completed a trade Certificate I, II, III as part of an Apprenticeship either at TAFE or through a private Registered Training Organisation (RTO).

For more information on Engineering Trade careers '[Click Here](#)'

Para-professional or Technical Engineer: These engineers have completed a TAFE Diploma or Advanced Diploma.

For more information on Para-professional or Technical Engineering careers '[Click Here](#)'

Professional Engineer:

These engineers have obtained a university Bachelors Degree.

For more information on Professional Engineering careers '[Click Here](#)'

Engineering career pathways

Your career pathway in engineering begins in high school where you may study a combination of maths, science, design and technology subjects. '[Click Here](#)' for more information on engineering pathways.

Trade Engineering Pathway

You may undertake a Certificate I, II or III in Engineering while at high school to give you some practical 'trade' skills. Alternatively you may undertake a pre-apprenticeship course at TAFE before applying for an apprenticeship.

Para-professional or Technical Engineering Pathway

The para-professional engineering pathway prepares you for careers in design and drafting, technical services and management. As a para-professional engineer you bridge the gap between trades people and professional engineers.

As a para-professional engineer your training starts with a Diploma where you learn to apply scientific principles and problem solving techniques to real engineering situations. Some people who have limited maths or science experience may begin with a Certificate III.

Once you have completed a Diploma you will find employers very keen to offer you a job. Alternatively, you may prefer to continue your studies to Advanced Diploma level. Obviously, employers will value your increased expertise in managing projects, resources and people.

Many TAFEWA graduates also use their qualifications as a stepping stone to gain entry into engineering courses at university.

Professional Engineering Pathways

For all Bachelor of Engineering courses, in addition to meeting standard admission requirements, students must have successfully completed TEE Applicable Mathematics or preferably TEE Calculus. Please check each university's requirements as they may change.

About TAFEWA Engineering Courses

TAFEWA Colleges offer a range of courses for para-professional engineers.

The advantage of studying engineering at TAFEWA is that it encourages "learning-by-doing". This means that - in addition to learning relevant theoretical concepts - the focus is on developing hands-on practical skills that are highly valued by industry.

During their training, TAFEWA students apply their engineering knowledge and skills to engineering projects and to real situations and problems encountered in industry.

TAFEWA courses are developed with the input of industry leaders. This ensures they are customised to meet the technology and skill requirements of local, state and national employers.

You can choose to study in one of these fields:

Infrastructure

Electrical

Aeronautics

Technical

Resource

structural

electrical systems

aviation

mechanics

metallurgy

civil

electrical design and drafting

mechanical services

non destructive testing

design and drafting

renewable energy

mechatronics

mining

environmental

electronics and communications

manufacturing

surveying

computer systems

maintenance

process plant technology

instrumentation and control

TAFE Trade engineering Courses

TAFEWA Engineering trade courses include heavy metal fabrication/welding and mechanical trades including mechanical fitting, machining, hydraulics and pneumatics. Higher level courses are also available in welding certification, inspection and supervision. Engineering trade qualifications equip students with the essential skills for the heavy and light engineering industry. There is strong demand for these skills in a range of employment areas including defence and construction as well as oil and gas, mining and mineral processing industries

Trade qualifications are structured to provide practical training in metal trades areas including metal (steel or aluminium) fabrication/boilermaking, sheet metal work, mechanical fitting, fitting and machining and plant mechanics.

The wa defence industry

There are some great career opportunities in the WA Defence Industry. Some people get the defence industry confused with the Defence forces. There is a big difference between the Australian Defence Forces (ADF) and the WA defence industry. For a start, working in the defence industries doesn't involve joining the army or navy, wearing a uniform, or being shipped overseas.

There are many highly-paid and rewarding civilian engineering careers in industries providing support to the ADF that allow engineers to live and work in their own community.

The defence industry employ approximately 3000 people directly and 20 000 indirectly in WA, and have generated in excess of \$1.1billion for the WA economy. The defence industry is experiencing a critical shortage of skilled engineers and tradespeople. With the Federal Government's release of the Defence Capability Plan 2006-2016 engineers will remain in high demand in the long term.

Much of the work undertaken by the defence industries revolves around the design and construction of naval vessels and the development and maintenance of aircraft, telecommunications and electronic equipment.

Projects in the defence industries rely on cutting-edge technology, such as in the design and integration of sophisticated combat systems.

current wa projects

With the signing of 'through life' and 'to retirement' maintenance agreements between the Australian Defence Force and Western Australian defence industry companies, there is sustained work in the defence marine and aviation industries for at least the next 20 years. There are also a number of one off ship builds as well as on going maintenance and refurbishment activities occurring in general marine and commercial aviation.

Aircraft maintenance

Aviation companies in Western Australian are responsible for the maintenance contracts for a number of aircraft used by the Royal Australian Air Force and Navy. These contracts ensure there is long term maintenance and repair work for aviation engineers.

Ferries

Austal recently completed the construction of the 65 metre "Shinas"™ ferry for the Sultan of Oman. This is the fastest diesel powered catamaran ferry in the world. A second vessel is due for completion at the end of 2008.

High speed catamarans

Austal will construct 10 high speed passenger catamarans for the Venetian Marketing Services Limited. These will be based in Hong Kong for the entertainment, gaming and hotel clients in

Macao.

Patrol boats

10 37.5 metre aluminium patrol boats for the Yemen Ministry of Defence have recently been completed. These boats will be involved in surveillance, interception, investigation and escort to port of vessels suspected of illegal activities.

Pursuit vessels

Police pursuit vessels for WA and Singaporean police are currently under construction.

Submarines

ACS (formally known as Australian Submarine Corporation) will provide support and upgrades for the six Royal Australian Navy Collins Class submarines. ASC developed these vessels in 2003. The 25 year repair and maintenance program will employ 185 people who will undertake several million dollars worth of maintenance on the subs each year. Numerous local companies will be involved in this maintenance from electrical upgrades, mechanical repairs and out fit refurbishment.

Other marine work includes the design, construction and outfitting for passenger and vehicle catamarans, private pleasure crafts and sports cruisers, combat ships for the US navy, patrol vessels for Department of Environment and Conservation, rescue vessels for FESA, fishing vessels, tuna boats, and assorted research boats.

Defence industry careers

The ship building industry in WA is responsible for nearly half of the commercial ship building activity in

Australia. WA also produces military and para-military vessels for the Australian Government as well as international agencies including police, navies and coast guards. The state is also a recognised designer and supplier of aluminium vessels for both military and commercial uses.

Aviation overhaul and maintenance activities occurs throughout the metropolitan area to support the Royal Australian Air Force. Pilot training in a growth area with more commercial pilots being training in WA. This is expected to grow with the expansion of both the

Perth and Jandakot airports.

The defence sector (army, navy, air force) is supported by approximately ten major companies employing approximately 3000 staff. The companies include:

- Airflite

- ASC

- Austal
- BAE Systems
- Formation Design Systems
- L-3 Communication Nautronix
- Raytheon
- Thales

These companies are supported by smaller local and interstate organisations on an as-needs and contractual basis. These companies include:

- Austindo
- EJ Electrical Engineering Contractors<
- Hanseatic
- Marine Inspection Services
- Westralian Engineering

The defence sector spends about \$800 million per annum in WA to these companies.