Demystifying Engineering

Courses in Focus: Engineering courses in Tasmania
Labour Market Information: Engineering Occupations
Pathways into Bachelor of Engineering (Specialisation) in Tasmania

Have you ever wondered what an Engineer does? Check out this video clip created by the University of Newcastle that shows how engineering influences your daily life from the moment you wake up in the morning.

Source: University of Newcastle. Available at: https://www.youtube.com/watch?v=bipTWWHya8A
Engineers shape our lives by applying the creative tools of Maths and Sciences to solve complex problems and improve our daily life, communities, cities and towns, land, water, resources, infrastructure and more.

The occupation of Engineer is hugely varied. Engineers Australia listed these engineering fields as just some of the available engineering specialisations:

- Aerospace Engineering
- Agricultural Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Electronics Engineering
- Environmental Engineering
- Industrial Engineering
- Marine Engineering
- Materials Engineering
- Mechanical Engineering
- Mechatronics Engineering
- Nano-Engineering
- Software Engineering
- Space Engineering

Go to the Engineers Australia website if you want to find out more about these types of engineering and how they will shape our future.

Engineers in all specialisations have these skills and qualities:

- Engineers are great problem solvers who apply a high level of maths and science, creativity and imagination to isolate, analyse and address problems.
- Engineers thrive on fixing and improving things to make them work better and more efficiently at lower cost.
- Engineers are great communicators and team players. They communicate ideas and instructions, consult with teams of professionals and write reports and documentation that are easy to understand.
- Engineers see the big picture. They understand the full scope of a project and its constraints, manage project budgets and timelines, and they manage the people, processes and machinery involved in completing a project, while adhering to the highest standards of quality and safety.

These transferable skills and continued professional learning can assist engineers to work in different specialisations.

Engineers Australia identifies three levels of engineers. These are:

1. **Professional Engineers** complete a four-year accredited engineering degree at a university or other higher education institution. Professional Engineers focus on overall systems. They develop and apply new engineering practices and apply leadership and management skills.

2. **Engineering Technologists** complete a three-year accredited engineering technology bachelor degree at a university, other higher education institution. Engineering Technologists analyse and modify engineering technologies and apply them in the testing and implementation of engineering projects.

3. **Engineering Associates** complete a recognised two-year Associate degree or Advanced Diploma at a university, other higher education institution, TAFE or other Registered Training Organisation. Engineering Associates focus on specific elements of the system, work within codes and apply established practices and procedures.

You can explore engineering courses Australia-wide on these websites:

**Engineering Technologist Courses:**
- Course Seeker

**Professional Engineer Courses:**
- Myfuture
- Course Seeker

**Engineering Associate Courses:**
- My Skills
- Myfuture

You can check to see if the course you are considering is accredited by Engineers Australia by searching through the list of accredited courses.

1 University of New South Wales Engineering. Available at: https://www.engineering.unsw.edu.au/what-engineers-do
2 Engineers Australia Occupational Categories. Available at: https://www.engineersaustralia.org.au/Membership/Occupational-Categories
Engineering Courses in Tasmania

Four education institutions offer courses in the field of engineering in Tasmania. These include TasTAFE, the Australian Maritime College, the University College and the University of Tasmania. The courses are listed here.

TasTAFE

Certificate II Engineering Pathways
Certificate II Engineering Production Technical
Certificate III in Engineering - Fabrication Trade
Certificate III in Engineering – Mechanical Trade
Certificate IV in Engineering
Certificate IV in Engineering Drafting
Diploma of Engineering – Advanced Trade
Diploma of Engineering - Technical

All engineering courses offered by TasTAFE are nationally recognised vocational education and training courses that provide skills for jobs. Recognition for Prior Learning (RPL) may be granted for entry into Advanced Diploma in Engineering courses that meet Australia Engineers requirements for Associate Engineer status.

Successful completion of a Certificate III or higher Engineering course at TasTAFE may be considered for entry into a related Associate Degree or Bachelor Degree at university.

University College

Associate Degree in Equipment Design and Technology

Australian Maritime College (AMC)

Bachelor of Engineering (Specialisation) with Honours You can watch a video clip on Engineering and Hydraulics at the Australian Maritime College and follow the links to find out what is involved in the available specialisations of:
- Naval Architecture
- Ocean Engineering
- Marine and Offshore Engineering

Bachelor of Engineering (Specialisation) with Honours (Co-operative Education)

AMC Engineering Pathway Course

Diploma of University Studies, (Engineering)

All Australian Maritime College Bachelor of Engineering (Specialisation) Honours courses are accredited by Engineers Australia to Professional Engineer status.

University of Tasmania

Bachelor of Engineering (Specialisation) with Honours

Select the Course Structure tab to find out about the degree specialisations of:
- Civil Engineering
- Electronics and Communications Engineering
- Electrical and Electronics
- Electrical Power Engineering
- Mechanical Engineering

Bachelor of Engineering Technology, (Professional Honours in Infrastructure)

Asset Management

Bachelor of Surveying and Spatial Sciences

Bachelor of Science and Bachelor of Engineering (Specialisation) Honours

Diploma of Engineering Infrastructure, (Specialisation)

The only specialisation available at this time is Rail.

Diploma of Equipment Design and Technology

Diploma of Construction Management

University of Tasmania Engineering Pathway Courses:

Diploma of University Studies, (Engineering Specialisation)

University Preparation Program

All University of Tasmania Bachelor of Engineering (Specialisation) Honours courses are accredited by Engineers Australia to Professional Engineer status.
Labour Market Information: Engineering Occupations

Engineering graduates from VET or higher education courses are likely to find employment soon after they complete their qualification. In 2018, 85.2% of those who completed an Engineering qualification at TAFE or a Registered Training Organisation obtained full-time employment within 6 months of completing their qualification1 and 83.1% of those who completed a bachelor degree in engineering or engineering technologies at a university or other higher education institution obtained full-time employment within 4 months of graduation2. This compares to an average across all study areas of 73.3% getting a job within four months of graduation.

The table to the right shows growth or decline in some engineering trade, technical and professional occupations that you may be able to work in with a TasTAFE, Australian Maritime College, University College or University of Tasmania qualification in, or related to, engineering.

1 NCVER VET Student Outcomes.
2 The National Graduate Outcomes Survey

<table>
<thead>
<tr>
<th>Occupation</th>
<th>No. Employed May 2018</th>
<th>Estimated Employment May 2023</th>
<th>% change**</th>
<th>% Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engineering Trades</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Casting, Forging &amp; Finishing Trades</td>
<td>5,100</td>
<td>5,100</td>
<td>0</td>
<td>1.6</td>
</tr>
<tr>
<td>Metal Fitters &amp; Machinists</td>
<td>115,500</td>
<td>113,800</td>
<td>-1.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Precision Metal Trades</td>
<td>6,100</td>
<td>5,700</td>
<td>-6.6</td>
<td>2.2</td>
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<tr>
<td>Sheetmetal Trades</td>
<td>8,100</td>
<td>8,500</td>
<td>4.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Structural Steel &amp; Welding Trades</td>
<td>78,900</td>
<td>82,700</td>
<td>4.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Toolmakers &amp; Engineering Patternmakers</td>
<td>2,200</td>
<td>2,200</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Engineering Technicians</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Engineering Draftspersons and Technicians</td>
<td>8,500</td>
<td>8,700</td>
<td>2.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Electrical Engineering Draftspersons and Technicians</td>
<td>11,200</td>
<td>12,200</td>
<td>8.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Electronic Engineering Draftspersons &amp; Technicians</td>
<td>5,500</td>
<td>5,000</td>
<td>-9.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Mechanical Engineering Draftspersons &amp; Technicians</td>
<td>4,700</td>
<td>4,400</td>
<td>-6.4</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Engineering Professionals</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Civil Engineering Professionals</td>
<td>53,300</td>
<td>60,500</td>
<td>22.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Electrical Engineering professionals</td>
<td>18,800</td>
<td>18,300</td>
<td>-2.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Electronic Engineers</td>
<td>4,100</td>
<td>3,900</td>
<td>-4.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Engineering Managers</td>
<td>22,900</td>
<td>26,400</td>
<td>15.3</td>
<td>1.2</td>
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<tr>
<td>Mechanical Engineering Professionals</td>
<td>10,200</td>
<td>14,000</td>
<td>37.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Telecommunications Engineering Professionals</td>
<td>15,500</td>
<td>18,500</td>
<td>19.3</td>
<td>1.0</td>
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<tr>
<td>Engineering Professionals - Naval Architecture</td>
<td>330</td>
<td>320</td>
<td>-3.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Geotechnical Engineering***</td>
<td>1300</td>
<td>1500</td>
<td>15.4</td>
<td>1.6</td>
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</tbody>
</table>

**Highlights:**

1. The engineering trades of Sheetmetal & Welding and Structural & Steel Welding may have promising job prospects in Tasmania because:
   - both occupations employ a large number of workers
   - both occupations are expected to employ more people in the coming years
   - proportionately there are more jobs in these occupations in Tasmania compared to some other parts of Australia.

2. The engineering technicians occupation group of Electrical Engineering Draftspersons and Technicians may have promising job prospects in Tasmania because:
   - the occupation group is large and is expected to increase its share jobs in the coming years
   - there are proportionately more Electrical Engineering Draftspersons and Technicians jobs in Tasmania compared to some other states and territories.

3. There are not as many professional engineers in Tasmania compared to other parts of Australia. This is because Tasmania has a 2% share of jobs in the Australian labour market, yet the only engineering profession that has more than a 2% share of jobs in Tasmania is Naval Architect. This means that some people who complete a professional engineering qualification in Tasmania may have more employment opportunities in other states or territories.

** Job vacancies will also arise from job turnover.
***Closest to Marine and Offshore Engineering and Ocean Engineering. Australian labour market statistics do not report data for Offshore Engineering or Ocean Engineering specialisations.
Pathways into Bachelor of Engineering

Complete your TCE, get a competitive ATAR and prerequisite subjects

AMC Bachelor of Engineering (specialisation) Honours
UTAS (Hobart) Bachelor of Engineering (specialisation) Honours

year one Engineering can be studied in Launceston then you can transfer to Hobart

Marine, Ocean, Naval Architecture, Civil, Electrical and Electronics, Electronics and Communication, Electrical Power, Mechanical, Surveying and Spatial Sciences, Engineering Technology, Infrastructure and Asset Management

Foundation Units (completed in January)

KMA003 Mathematics Foundation (if you didn’t study or pass MTM415117 Mathematics Methods or equivalent)
KRA001 Physics Foundation (if you didn’t study or pass PSC315114 Physical Sciences or equivalent)
KRA004 Chemistry Foundation (if you didn’t study or pass PSC315114 Physical Sciences or equivalent)

Enabling Programs

Diploma of University Studies
University Preparation Program if you haven’t completed year 12

CONTACT
For further information contact the Vocational Learning and Career Education Unit on VLCE@education.tas.gov.au or 6165 5404

This content was prepared by Dr Catherine Hughes, Career Development Consultant for Tasmanian Schools and Colleges.

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