

# What can I do with a degree in Mechanical Engineering?

# Mechanical Engineering.



## Career planning: what do I need to know?

Knowledge of yourself is important for career decision making. Start by looking at your personal goals, abilities, values and interests to explore study and career options that are relevant to you. Some of these may change over time, so it is important to self-reflect and evaluate your career on an ongoing basis.

### What do employers look for?

Many employers look for generic skills such as communication, customer-focus, bicultural competence, cultural awareness and teamwork. With technology and globalisation changing the nature of society, skills such as resilience, problem solving and adaptability are valuable at work as well as in life.

### How can I develop these skills?

- Some skills are developed through your degree

- Extra-curricular activities can help, for example getting involved in clubs, mentoring, cultural groups, part-time work or volunteering
- Be open to professional and personal development opportunities. Whether it is undertaking an internship, overseas exchange, skills seminar, or joining an industry group – these activities will enhance your employability.

### What else should I know?

The career options in this brochure are examples only and the list is not exhaustive. Some careers may require further study beyond a first degree or additional work experience. Some pathways and degrees have a recommended school background.

Find more subject details at  
[www.canterbury.ac.nz/subjects/enme](http://www.canterbury.ac.nz/subjects/enme)

If this brochure does not answer your questions, talking to an expert such as a career consultant can help you to identify the next steps in your career decision making journey.

[www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)

## What is Mechanical Engineering?

Mechanical engineers design and develop things that move or have moving parts – from aeroplanes to wind turbines to dishwashers, from the macroscopic (large) to the nanoscopic (very small). Mechanical engineers are systematic thinkers with a sense of social responsibility that leads them to constantly seek better ways of doing things.

Many mechanical engineers specialise in areas such as materials, dynamics and controls, product design, manufacturing, energy and thermodynamics, and mechanics. Others cross over into other disciplines, working on everything from artificial organs in bioengineering to enhancing the field of nanotechnology. The mechanical engineer may design a component, a machine, a system or a process, and ensure the product functions safely and efficiently, and can be manufactured economically.



## AT A GLANCE

89%

of mechanical engineering graduates were in their ideal employment or working in a step in the right direction\*

3.3%

is the projected employment growth for professional engineers\*\*

\$180k

is the top salary an experienced mechanical engineer working in a position of responsibility may earn<sup>^</sup>

## What skills have UC graduates gained?

Through their Mechanical Engineering degree, graduates develop a valuable set of skills that are transferable to a range of engineering disciplines, including:

- Creativity and innovation
- Logical and quantitative thinking
- Practical application of engineering technology and science
- Coding real life observations into mathematical expressions to be able to predict performance/behaviour
- Mechanical and computing abilities
- General problem solving and attention to detail
- Leadership and management qualities.

Students undertake 800 hours of practical work experience as part of this engineering degree, providing them with a good understanding of industry and the confidence to apply their skills at work.

Fourth Year students take on a unique, research and development project, most of which are sponsored by industry. These are supervised by UC staff members and an industry sponsor.

## Where have UC graduates been employed?

Mechanical engineers may work in areas such as product design, power generation, transport vehicles, medical technology, building services, manufacturing, controls, and materials.

UC graduates have been employed in:

- Manufacturing eg, Fisher & Paykel Healthcare, Talbot Technologies, Ravensdown Fertiliser, Springfree New Zealand, Fonterra
- Consulting eg, Opus International Consultants, WorleyParsons, AECOM, Aurecon
- Acoustics eg, Marshall Day Acoustics, BKL Consultants
- Construction eg, Leighton Contractors, Fletcher
- Infrastructure eg, Westnet Rail, Kiwirail
- Technology eg, Schlumberger, Seagate, Syft Technologies
- Natural resources eg, Halliburton, Woodside Petroleum, Altona Refinery
- Aviation, aeronautics and defence eg, ICON Aircraft, Sailing Yacht Gliss, Royal New Zealand Air Force, Air BP, Flight Structures Ltd, Airways New Zealand, Lockheed Martin Space Systems
- Electricity and energy services eg, Transpower, TFN Energy Ltd, Beca, EDF Energy, Energy NZ
- Research and development eg, Dow AgroSciences, Callaghan Innovation
- Product design eg, Mechanix Design Solutions, DESIGNsense

\* 2017, 2018, 2019 Graduate Destination Survey results combined

\*\* Occupation outlook [www.mbie.govt.nz](http://www.mbie.govt.nz)

<sup>^</sup> [www.careers.govt.nz](http://www.careers.govt.nz)

## What jobs and activities do graduates do?

Graduates are employed in a range of disciplines from aerospace to product development, automotive to marine engineering — see some examples below.

*Note: Some of the jobs listed may require postgraduate study. See the 'Further study' section*

### Mechanical engineer

- Investigates and optimises the use of energy, machinery and materials
- Designs products and processes
- Advises on the design, fabrication and repair of equipment, products and services

### Aeronautical and aircraft maintenance engineer

- Ensures safe flight performance of aircraft
- Investigates aircraft faults and defects and approves maintenance and repair processes
- Oversees aircraft design and/or modification
- Tests aircraft parts and systems
- Checks that regulations and requirements are met

### Design engineer, product development engineer

- Uses software to develop new product ideas
- Advises clients on plans and budgets
- Liaises with suppliers and manufacturers
- Designs and tests prototypes

### Process engineer

- Plans, manages and implements the control of a manufacturing process which turns raw materials into an end product
- Ensures the company creates goods efficiently, cost-effectively and to a precise standard
- Sets budgets, timeframes, and supervises staff

### Operations and fabrications engineer

- Develops, installs and restores products
- Deals with fabrication processes
- Ensures quality of product/production according to standards, specifications and tolerances

### Software engineer

- Analyses customer needs, evaluates computer software and researches new technologies
- Identifies solutions and develops software programs for new products or enhancements

### Instrumentation and controls engineer

- Designs a range of robotics, sensors, actuators and smart products for varied application eg, medicine, electronics, farming

- Sets up and monitors dynamic systems
- Conducts experiments in product design and safety

### Thermodynamics engineer

- Designs and develops energy-efficient processes
- Effectively analyses and resolves thermo-technical issues of facilities
- Typically works in building services

### Consultant engineer

- Plans, manages and supervises projects
- Conducts feasibility studies, prepares estimated costs, helps secure patents
- Finds solutions to problems
- Ensures legal obligations are met

### Quality engineer, test engineer

- Designs tests to check software/systems/processes/products
- Identifies issues, defects or bugs, and fixes them

### Project engineer, project manager

- Manages project plans, times, costs, compliance
- Manages procurement, purchasing, contracts
- Liaises with project staff and clients

### Tertiary lecturer / tutor

- Prepares and gives lectures and tutorials
- Sets and marks assignments and exams
- Conducts research, writes and publishes articles

### Entrepreneur & self-employment

Entrepreneurship and innovation are an increasing part of the working landscape. Through generating a business idea, or getting involved in a start-up/business venture, you have the potential to create a work opportunity that aligns with your knowledge, skills, values and risk profile. To get started on how to establish, run and grow a new business, go to Te Pokapū Rakahinonga, Centre for Entrepreneurship at the University of Canterbury [www.canterbury.ac.nz/uce](http://www.canterbury.ac.nz/uce)



## What professional organisations can I engage with?

Connecting with professional bodies and organisations can help you to establish professional networks and learn more about different career options in your area of interest. Gaining valuable insight into a profession can assist in making informed career decisions.

- Engineering New Zealand [www.engineeringnz.org](http://www.engineeringnz.org)
- The Association of Consulting Engineers New Zealand Inc. [www.acenz.org.nz](http://www.acenz.org.nz)
- New Zealand Heavy Engineering Research Association [www.hera.co.nz](http://www.hera.co.nz)
- American Society of Mechanical Engineers [www.asme.org](http://www.asme.org)

Having a professional presence on social media networks such as [www.linkedin.com](http://www.linkedin.com) and Facebook can help you to keep up to date with important industry developments and trends, networking opportunities, events and job vacancies. Following relevant professional bodies, organisations, companies and thought leaders is a great way to gain a deeper awareness of the industries that interest you. Social media presents an opportunity to build and enhance networks as well as to display your involvement in projects and any academic successes.

## Why do further study and what are my options?

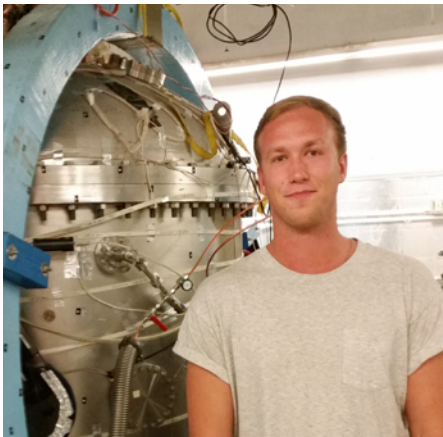
Postgraduate study can facilitate career benefits such as specialist skills, faster progression rate, and research capability. Advanced study can lead to a career in academic teaching and research. It is important to determine which, if any, further study will help you in your future career.

Graduates can study Mechanical Engineering at postgraduate certificate, master's and PhD level at UC. There are also programmes in Engineering Management. For UC qualification listings visit [www.canterbury.ac.nz/courses](http://www.canterbury.ac.nz/courses)

### Useful links

- Te Rōpū Rapuara UC Careers [www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)
- Careers New Zealand [www.careers.govt.nz](http://www.careers.govt.nz)

## George



Bachelor of Engineering with Honours in Mechanical Engineering  
Master of Science in Plasma Physics,  
Columbia University, New York, USA  
Venture Fellow, WME Ventures,  
New York, USA

### What did you enjoy about studying at UC?

The Mechanical Engineering department is strong at UC with a wealth of talented and friendly staff. I enjoyed working with my lecturers and the department technicians — I am extremely appreciative of their guidance as it has served me well since leaving university.

### How was the experience in your first graduate job?

I worked on an engineering project team for the construction of a new \$200m Granodiorite mine in New South Wales, Australia which was an amazing first job. I worked with an impressive engineering team from all over the world.

### How did your degree prepare you for your chosen field?

Mechanical engineering is definitely the most wide-ranging engineering discipline and it has prepared me well. It has given me the ability to work a number of different capacities, many of which would be considered outside the domain of mechanical engineering.

There was a huge emphasis on the hands-on side of engineering. We were often reminded of the importance of critical thinking, problem solving and creativity, which are the real tools for success as an engineer.

### How did you get overseas and what did you do in the US?

I was awarded a Fulbright Scholarship to attend Columbia School of Engineering and Applied Science in New York, where I completed my Master of Science degree in Plasma Physics.

I spent most of my time at Columbia working on the experimental tokamak HBT-EP. Energy experts believe that tokamak technology is the holy grail of modern electricity. Ultimately, I want to be involved in the development of new forms of sustainable and renewable energy.

### Where are you now?

WME Ventures targets investment opportunities in early stage, high growth technology companies. At WME, I am honing my analytical skills and gaining business knowledge of the technology sector in the US. Employment at a technology-focused venture capital fund is providing me with first-hand exposure to novel ideas while allowing me to create great contacts at the companies we are interacting with.

### Read more online

Read George's full story and find out where Mechanical Engineering graduates are now at [www.canterbury.ac.nz/get-started/why-uc/student-profiles](http://www.canterbury.ac.nz/get-started/why-uc/student-profiles)

*The information in this brochure was correct at the time of print but is subject to change.*

## More information

### UC students seeking study advice.

Te Tari Pūhanga Pūrere | Department of Mechanical Engineering

Mechanical engineering at UC has a strong focus on engineering design and professional relevance. The programme is internationally accredited, and our graduates have gone on to excel in leading technical innovation in many sub-fields.

T: +64 3 369 2229

E: [engdegreeadvice@canterbury.ac.nz](mailto:engdegreeadvice@canterbury.ac.nz)

[www.canterbury.ac.nz/engineering/schools/mechanical](http://www.canterbury.ac.nz/engineering/schools/mechanical)

### Anyone seeking careers advice.

Te Rōpū Rapuara | UC Careers

UC offers intending and current students and recent graduates a wide range of services, including individual career guidance, seminars, career resources and student and graduate employment opportunities.

T: +64 3 369 0303

E: [careers@canterbury.ac.nz](mailto:careers@canterbury.ac.nz)

[www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)

### Prospective students seeking study advice.

Te Rōpū Takawaenga | Student Liaison

Student Liaison provides intending students with information about the university system in general and the courses, qualifications, support and facilities available at UC.

Ōtautahi | Christchurch

T: 0800 VARSITY (0800 827 748)

E: [liaison@canterbury.ac.nz](mailto:liaison@canterbury.ac.nz)

Tāmaki Makaurau | Auckland

T: 0800 UCAUCK

E: [auckland@canterbury.ac.nz](mailto:auckland@canterbury.ac.nz)

Te Whanganui-a-Tara | Wellington

T: 0800 VARSITY (0800 827 748)

E: [wellington@canterbury.ac.nz](mailto:wellington@canterbury.ac.nz)

[www.canterbury.ac.nz/liaison](http://www.canterbury.ac.nz/liaison)

