

I wonder
how I can
engineer
the future?



Wonder
Project

STEM
Careers

engineering





Engineers fuse science, maths, technology and creativity to invent a better world.

Engineers are practical people with curious minds, who want to figure out how things work and find smart solutions to real problems.

The Pyramids, Stonehenge, the International Space Station and the Eiffel Tower are just a few examples of the impact of engineering. Today's engineers continue to build huge structures, but they also build maps to the human genome, virtual reality, smartphones, computer games and more.

Would you make a good engineer?

Working on solutions to real-world problems is at the heart of all engineers. They dream up solutions that improve our lives, fulfil human needs, and strive to make our world a better place.

From figuring out how to assist populations with no access to clean drinking water, to designing a better smartphone, engineers live for the opportunity to make a difference.



If you answer yes to any of these, a career in engineering is right for you. That's the magic of engineering – you can do what you love.



- ✓ You're interested in evaluating the design or effectiveness of a product or service
- ✓ You enjoy working with team members to solve a problem
- ✓ You like using data to make a decision



- ✓ You enjoy documenting a process for building or repairing things
- ✓ You like using maths to solve real-world challenges
- ✓ You enjoy explaining scientific findings to others



- ✓ You enjoy hands-on work
- ✓ You're interested in computers and gaming
- ✓ You love drawing pictures, sketching and visualising ideas



Here's just a few of the diverse engineering careers that you could pursue.



Civil engineer Kaipūhanga metarahi

The Golden Gate Bridge and the Sky Tower wouldn't exist without civil engineers. They design and build our physical world – from bridges, roads and dams, to airports and skyscrapers. If you become a civil engineer, you can choose to specialise in structural, environmental, transportation or geotechnical engineering.



Electrical engineer Kaipūhanga hiko

We wouldn't have modern life as we know it without electrical engineers. Their work encompasses all things electric, including how to produce and distribute power, telecommunications, security systems, and smart buildings. They also design electrical equipment like computers, cameras, dishwashers and smartphones.



Mechanical engineer Kaipūhanga pūrere

Mechanical engineers design, build and maintain power-producing machines and tools, like generators, earth moving machinery and medical equipment, as well as power-using machines, like refrigerators. They also figure out how to fix machinery and improve manufacturing and energy production.



Aeronautical engineer Kaipūhanga rererangi

Want your career to fly? Aeronautical engineers design, develop, manufacture and maintain all types of aircraft from planes and helicopters to rockets, making it safer for people to take to the skies.



Biomedical engineer Kaipūhanga āpitihanga tinana

Combining engineering, medicine and biology to improve the quality of our lives by fixing problems in the healthcare industry. They design, build and maintain medical equipment, artificial body parts and software that helps people overcome disabilities, diseases and injuries.



Mechatronics engineer Kaipūhanga hangahiko

Keen to bring robots to life? Mechatronics engineers design and program smart devices, robots and intelligent systems. They blend mechanical, electronics, computer and software engineering, making them generalists who can shine in many industries.



Chemical and process engineer Kaipūhanga matū, tukanga hoki

Experts at transformation. They turn raw materials into products, like food, fuel and pharmaceuticals. They take experiments or prototypes and make them commercially viable, using chemical, physical or biological processes.



Software engineer Kaipūhanga pūmanawa

We live in a digital world. Software engineers write software and develop the hardware it runs on, from Google to Uber to Fortnite. Software engineering brings together the disciplines of computer science and information technology, but computer software engineers can get a job in almost any industry.

Pathways to an engineering career

Most engineering careers begin with a strong knowledge of maths and physics, so studying these subjects at school will help.

Engineering pathways range from certificates and diplomas to a three-year Bachelor of Engineering Technology or a four-year Bachelor of Engineering. You'll also have heaps of opportunities for postgraduate study.



Chemistry



Physics



Calculus



Technology



Maths



English



Science

These are just some of the tertiary options available in engineering and the job roles that they lead to. The qualifications offered and their entry requirements are subject to change, so please check with the tertiary institution where you intend to study.

Year 11

NCEA L1

Including credits in:



Year 12

NCEA L2

Including 12 credits in:



Year 13

University Entrance
42 NCEA L3 credits

Including 14 credits in:



University Entrance
NCEA L3

Including 16 credits in:



National Certificates in Engineering

NZQF L2-5

I could be a...

- ✓ Telecommunications technician
- ✓ Automotive mechanic
- ✓ Electrician

NZ Diploma in Engineering (NZDE)

2 years of full-time study or cadetship.
NZQF L6

NZ Diploma in Engineering Practice (NZDEP)

2-4 years of work-based
assessment.
NZQF L6

I could be a...

- ✓ Rooding engineer
- ✓ Electronics technician
- ✓ CAD designer

NZDE credits can count towards a
BEngTech or BE.

Bachelor of Engineering Technology (BEngTech)

3 years of full-time study.
NZQF L7

BEngTech credits can count towards
a BE or BE(Hons).

Bachelor of Engineering (BE or BE(Hons))

4 years of full-time study.
NZQF L8

I could be a...

- ✓ Software developer
- ✓ Electronics engineer
- ✓ Water resources engineer
- ✓ Robotics engineer
- ✓ Geotechnical engineer
- ✓ Environmental engineer
- ✓ Biomedical engineer
- ✓ Rocket engineer

National Certificates in Engineering

NZQF Level 4-5

Varying years of study

National Certificates in Engineering can get you a career in engineering trades. Most certificates are offered by the relevant Industry Training Organisation (ITO), often with the course work component completed through a polytechnic or institute of technology. Pre-trade qualifications can be completed at most polytechnics.

Career opportunities

- ✓ Electrician
- ✓ Electronics trades worker
- ✓ Line mechanic
- ✓ Lift technician
- ✓ Industrial electrical engineering technician
- ✓ Fabricator
- ✓ Sheet metal worker
- ✓ Boilermaker
- ✓ Welder
- ✓ Fitter welder
- ✓ Fitter and turner
- ✓ Maintenance and diagnostic engineer
- ✓ Toolmaker
- ✓ Precision machinist
- ✓ Machine tool setter

Specialisations

- ✓ Electrical engineering
- ✓ Fabrication engineering
- ✓ Mechanical engineering

Entry requirements

NCEA Level 1



(Materials Technology and Design & Visual Communications strongly recommended)

Some courses may require at least 10 NCEA Level 1 credits in English and Maths.

Higher level certificates will generally require you to be working in a relevant engineering job.

The years of study varies depending on the type of study and location.

New Zealand Diploma in Engineering (NZDE)

NZQF Level 6

2 years of study

The NZDE combines applied academic study with practical skills, and prepares you for employment in the engineering industry.

Career opportunities

- ✓ Computer assisted design
- ✓ (CAD) drafting
- ✓ Managing construction sites
- ✓ Designing improvements to machinery used in manufacturing
- ✓ Developing high tech electronics equipment

New Zealand Diploma in Engineering Practice (NZDEP)

NZQF Level 6

3 years of study

The NZDEP is a work-based qualification and tests your practical application of engineering knowledge and skill in a particular industry sector.

Career opportunities

- ✓ Engineering consultancy
- ✓ Maintenance or asset management
- ✓ Design, manufacturing, installation, production engineering
- ✓ Technical sales and customer service
- ✓ Draughting services
- ✓ Construction or contracting

Entry requirements

48 NCEA Level 2 credits

Including 12 credits in:



Technology subjects are strongly recommended.

Check with your chosen tertiary provider as they may have slightly different entry requirements.

Bachelor of Engineering Technology (BEngTech)

NZQF Level 7

3 years of study

The BEngTech is a degree comprising of core and elective courses, with a focus on the design and implementation of engineering technology. Engineering technologists are in high demand and this degree gives you the opportunity to explore a wide variety of careers.

Career opportunities

- ✓ Civil engineer
- ✓ Electrical engineer
- ✓ Mechanical engineer
- ✓ Draughtsperson
- ✓ Environmental engineer
- ✓ Natural resources engineer
- ✓ Structural engineer
- ✓ Water and waste engineer

Specialisations

- ✓ Civil engineering
- ✓ Mechanical engineering
- ✓ Electrical engineering

Entry requirements

42–60 NCEA Level 3 credits

Including 14 credits in:



Technology subjects are strongly recommended.

A bridging course may allow you to catch up if you don't have the necessary credits in Maths and Physics.

Starting with an NZDE and cross-crediting, you could complete both qualifications in seven or eight semesters.

Bachelor of Engineering (BE)

NZQF Level 8

4 years of study

The BE is a professional degree accredited by Engineering New Zealand, allowing you to work as a professionally qualified engineer all over the world. Completing this degree will open up the full range of engineering careers available with the extensive options of specialisation.

Career opportunities

- ✓ Consultant engineer
- ✓ Hardware and software developer
- ✓ Project manager
- ✓ Quantity surveyor
- ✓ Research and design engineer
- ✓ Systems engineer
- ✓ Biomedical engineer
- ✓ Structural engineer
- ✓ Civil engineer

Specialisations

- ✓ Civil engineering
- ✓ Chemical, materials and process engineering
- ✓ Electrical and electronic engineering
- ✓ Mechanical and mechatronics engineering
- ✓ Software, electronic and computer systems engineering
- ✓ Biomedical engineering
- ✓ Engineering science
- ✓ Forestry
- ✓ Natural resources engineering
- ✓ Network engineering
- ✓ Innovation and engineering management

Entry requirements

University Entrance

14–18 NCEA Level 3 credits



14–16 NCEA Level 3 credits in Chemistry are required for some specialisations.

If you don't have the necessary credits in Maths and Physics, you may be able to catch up with a bridging course.

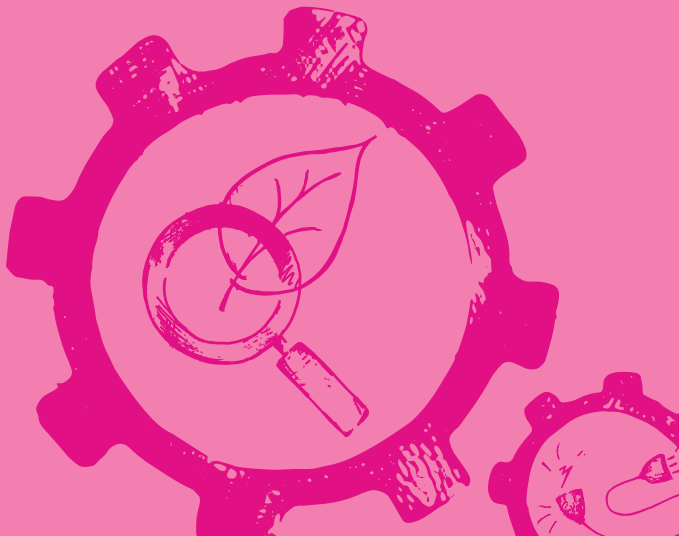
Check with your chosen tertiary provider as they may have slightly different entry requirements.

With an NZDE or BEngTech, you can cross-credit your courses and complete a BE in less than four years.



**“The engineer
has been, and
is, a maker of
history.”**

James Kip Finch
American engineer and educator





**WHERE SCIENCE
TECHNOLOGY
ENGINEERING AND
MATHS COME ALIVE.**

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engineering and maths. Explore your STEM career at
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