Welcome, Nau mai, haere mai

Studying at UC's Faculty of Engineering

UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What we offer

- Bachelor of Engineering with Honours – BE(Hons)

- Bachelor of Forestry Science – BForSc

- Bachelor of Product Design – BProdDesign

Why engineering?

If you…

- Like problem solving

- Enjoy maths and science

- Want varied career opportunities

- Want to develop new products in an innovative and sustainable way

- Want to make a difference and change the world
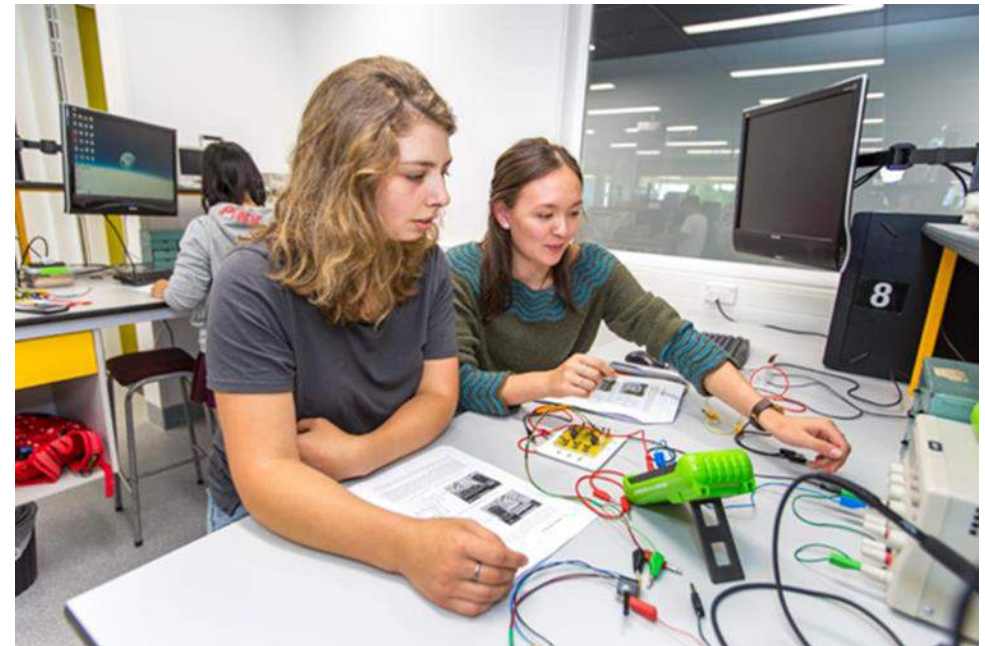
What do engineers do?

Engineers change how we live & see the world

Power our lives

Design how we communicate

Design how we move

Design manufacturing and processing

Design where we live, work and move

Design health solutions and assistive technologies
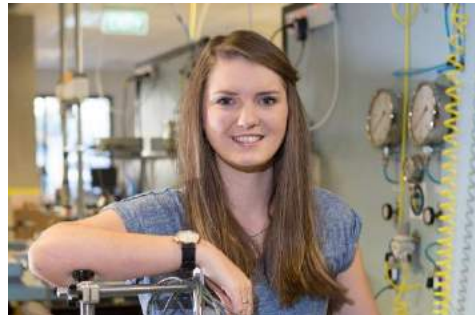
Design a more sustainable future

Help us see the universe

Who should be an engineer?

Who should be an engineer?

The importance of diverse designers

Engineering solutions are better solutions
when they're created by diverse teams.

Anyone can be an engineer!

Bachelor of Engineering with Honours

Design the future by developing new, innovative technology and providing solutions to meet the needs of our modern world.

- Four year degree
- Professional engineering degree
- Accredited by *Engineering NZ*
  (globally recognised, work overseas)

Pathways to Engineering

Standard Pathway

– Level 3 Maths or Calculus - 14 credits
– Level 3 Physics - 14 credits
– Level 3 Chemistry - 14 credits
(Chemical and Process, Civil, Natural Resources, Forest and Mechanical only)

Direct Entry

Top student? Direct entry into Second Year

Modified First Year

Exemption from some first year courses

Introductory Pathway

Not enough credits? Not the right subjects? Summer school or two-year First Year

Course Planner

canterbury.ac.nz/engineering/qualifications-and-courses/engineering/engineering-course-planner

BE(Hons) First Year

- Flexible first year
  - Foundations of Engineering
  - Engineering Maths
  - Physics
  - Computer Science
  - Elective(s)

- Keep options open for more than one discipline

Bachelor of Engineering with Honours – typical degree structure
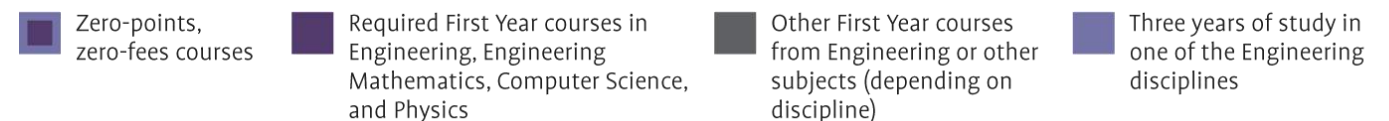
First Year

| ENGR 100 | ENGR 101 | EMTH 118 | EMTH 119 | PHYS 101 | COSC 131 | 100 Level | 100 Level | 100 Level |

Second Year

| ENGR 200 | |

Third Year

| ENGR 200 | |

Fourth Year

| ENGR 200 | |

◻ Zero-points, zero-fees courses

■ Required First Year courses in Engineering, Engineering Mathematics, Computer Science, and Physics

■ Other First Year courses from Engineering or other subjects (depending on discipline)

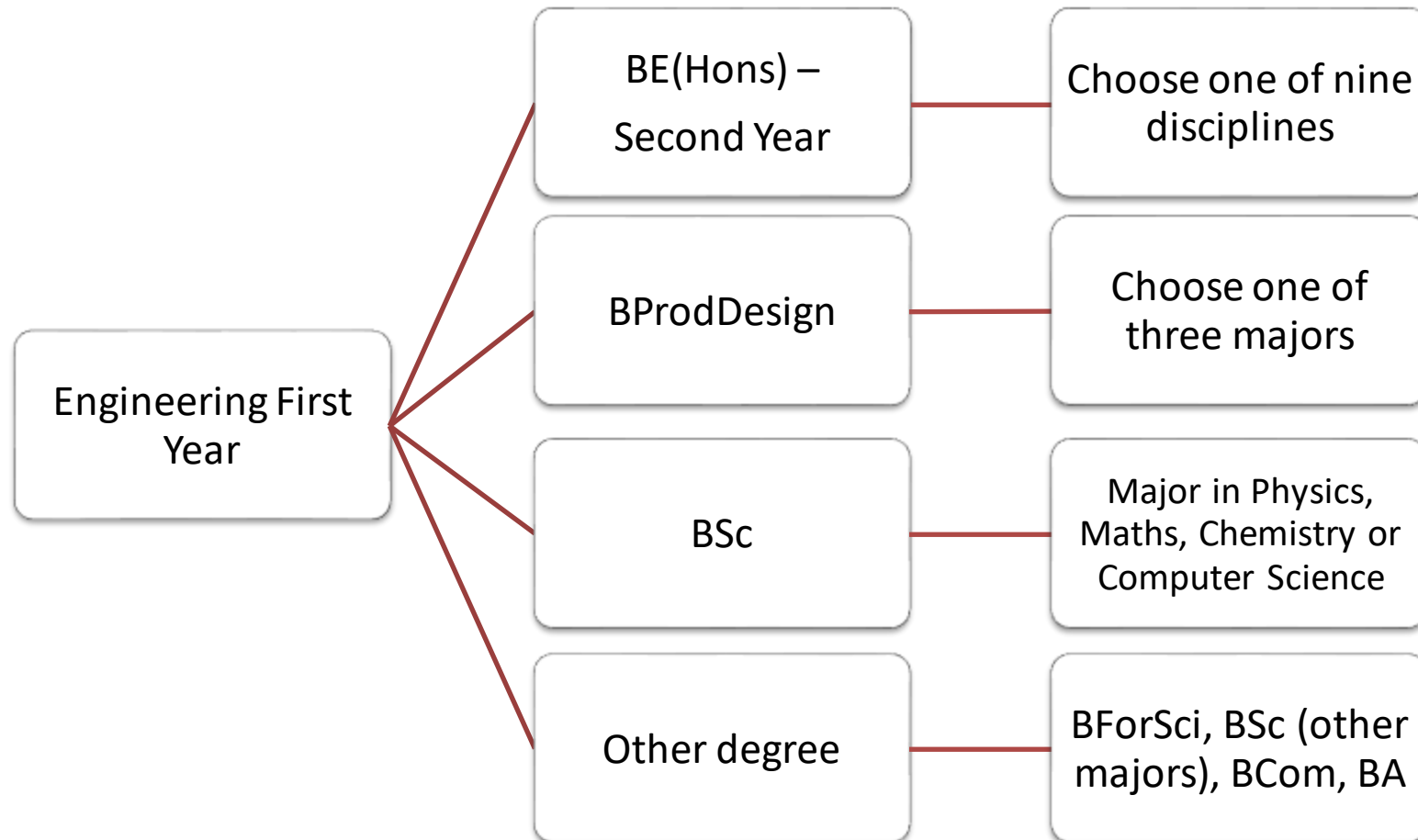■ Three years of study in one of the Engineering disciplines

Support during First Year

- ENGMe! mentoring programme
  - Student-led peer mentoring
  - Weekly meetings during semester 1
- Engineering First Year events
  - Pre-union party
  - 'Decide your discipline'
- Student clubs

Beyond First Year

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                    ┌─────────────────┐        ┌─────────────────┐
                    │   BE(Hons) –    │────────│ Choose one of nine│
                    │   Second Year   │        │   disciplines    │
                    └─────────────────┘        └─────────────────┘

                    ┌─────────────────┐        ┌─────────────────┐
                    │   BProdDesign   │────────│  Choose one of   │
┌─────────────────┐ └─────────────────┘        │   three majors   │
│ Engineering First│                            └─────────────────┘
│      Year       │ ┌─────────────────┐        ┌─────────────────┐
└─────────────────┘ │       BSc       │────────│  Major in Physics,│
                    └─────────────────┘        │ Maths, Chemistry or│
                                               │ Computer Science │
                    ┌─────────────────┐        └─────────────────┘
                    │  Other degree   │────────┌─────────────────┐
                    └─────────────────┘        │ BForSci, BSc (other│
                                               │ majors), BCom, BA │
                                               └─────────────────┘
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BE(Hons) 2nd – 4th Year

- Select from 9 engineering disciplines
- Enrol in your preferred engineering discipline at the end of First Year
- Lectures, labs, field work and a final year project
- 800 hours (100 days) of practical work in industry

9 engineering disciplines

Chemical and Process Engineering

- Transform raw materials into processed, marketable products
  - Food quality and supply
  - Pharmaceuticals
  - Environmental management
  - Waste processing
  - Energy production
  - Alternative fuels
- 3 minors available:
  - Bioprocess Engineering
  - Environmental Process Engineering
  - Energy Processing Technologies

Civil Engineering

- Design, construct, project manage and commission a wide range of facilities and infrastructure to withstand today's challenges
  - Buildings
  - Roads
  - Water supply
  - Transport
- 2 minors available:
  - Structural Engineering
  - Water and Environmental Systems Engineering

Natural Resources Engineering

- Improve and maintain the sustainability of natural resources through creative design and application of technology.
  - Land
  - Soils
  - Water
  - Atmosphere
  - Renewable energy
  - Biological resources (plants and animals)
  - Waste

Forest Engineering

- Design, construct and evaluate the operational systems that make the forest industry function safely.
  - Roads
  - Infrastructure
  - Harvest operations and technologies
  - Transport logistics
  - Environmental protection
  - Health and safety

Mechanical Engineering

- Design and develop everything that moves or has moving parts – from the macroscopic to the nanoscopic.

- 2 minors available:
  - Aerospace Engineering
  - Biomedical Engineering

Electrical and Electronic Engineering

- Create systems to provide efficient and sustainable power, the physical parts that transfer information between computers, and smart devices in the modern world.
  - Clean energy
  - Electrical power utilities and services
  - Nano/microscale electronic devices
  - Power electronics
  - Communications and signal processing
  - Medical imaging
- 1 minor available
  - Power Engineering

Mechatronics Engineering

- Design enhanced or 'smart' products, processes and systems to make life better, greener, healthier, more productive and more interesting.
  - Smart phones and TVs
  - Smart energy grids
  - Smart cars
  - Smart medical care and devices
  - Spacecraft
  - Autonomous vehicles - UAVs, AUVs, AGVs

Software Engineering

- Design, develop and deploy innovative solutions that reflect customer needs
- Creatively solve pragmatic problems in a range of industries (eg aerospace, education, e-health, finance)
  - Artificial intelligence
  - Computer graphics
  - Human-computer interaction
  - Programming
  - Network and security
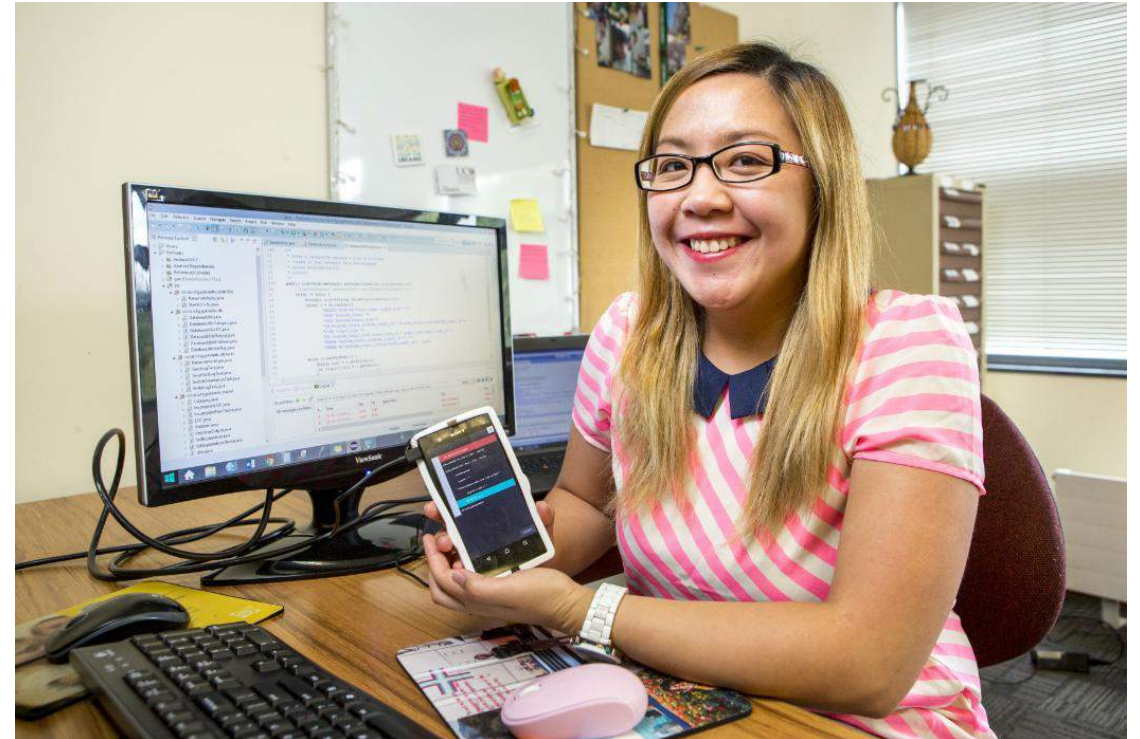
Computer Engineering

- Design and develop computer systems (hardware and processors)
- Focused on digital hardware devices and computers, and the software that controls them
  – Computer systems
  – Portable electronics
  – Autonomous robotics
  – Biomedical devices
  – Household items
  – Telecommunications and networks
  – Manufacturing and infrastructure

- 1 minor available:
  – Communications and Network Engineering

Differences between Computer Engineering, Computer Science, and Software Engineering

Software Engineering (SE)

- Building and maintaining software systems.
- Greater emphasis on large software applications than Computer Engineering.
- More applied than Computer Science, placing greater emphasis on the entire software development process, from idea to final product.
- Also more disciplined than Computer Science, applying more systematic practices to help ensure that products are reliable and safe.
- Efficient processes of systems.

Computer Engineering (CE)

- Designing, developing, and operating computer systems (hardware and processors).
- Concentrates on digital hardware devices and computers, and the software that controls them.
- In contrast to CS and SE, Computer Engineering emphasises solving problems in digital hardware and at the hardware-software interface.

Computer Science (CS)

- Understanding, designing, and developing programs and computers.
- Concentrates on data, data transformation, algorithms and specialised programming techniques.
- Less structured degree than the Computer or Software Engineering, giving flexibility for those who want to add other subjects to their study.

Diploma in Global Humanitarian Engineering

Help solve global issues such as food and water shortages, power supply, climate change, and ageing populations

- Unique programme in Aotearoa

- Mix of courses in engineering, social sciences, humanities and project work

- Opportunity to work in a disadvantaged or developing community

- Open to students in all engineering disciplines

- Gain an extra diploma qualification without adding time to your degree
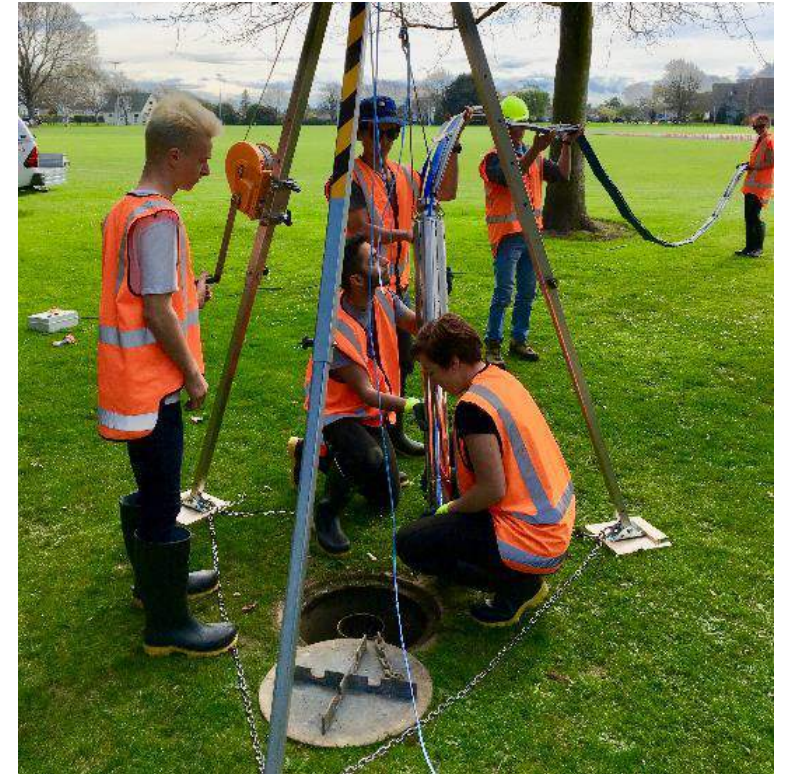
Bachelor of Forestry Science

Forest Scientists manage one of our most important natural resources, our forests, in one of NZ's biggest industries.

- Offered by the NZ School of Forestry

- Unique degree, only one in Aotearoa

- Four year professional degree

- Interdisciplinary degree covering all aspects of managing forests, both natural and plantation

- No specific entry requirements; Biology, Chemistry, Statistics, Economics, English recommended

Fund your study

- Engineering Top Achievers scholarship

- Specific awards for some engineering disciplines and forestry science

- Specific awards for Māori, Pasifika, International students

- Applications close 15 August

Next steps

- STEMinism – late June

- WiE CAN applications open – July

- Rā Tōmene | Open Day – Fri 9 Sep

- Campus tours – monthly

- Stay in touch!