2021
He Arataki Pūtaiao

Introduction to Science
SCIENCE GRADS GET JOBS

STEM graduates employed full-time earn more than non-STEM graduates (UC Graduate Destination Survey, 2019)

Ngā Kai o Roto | Contents

Plan your degree
1. Welcome to Science
2. Why Science?
4. Bachelor of Science
5. Follow your interests with the BSc
6. Checklist for entry to a BSc
7. Careers in science
8. Bachelor of Speech and Language Pathology with Honours
9. A career where you can make a difference
10. Bachelor of Forestry Science
11. Bachelor of Health Sciences
12. Certificates and diplomas
13. Conjoint and double degrees

Why study at UC
14. Study Science at UC
16. Applied learning
17. Student support
18. Interdisciplinary approach
19. Purpose-built
20. Living laboratory
21. Flexibility
22. Accessible experts
23. Compact campus and city

Subject guide
24. Subjects

More information
50. Planning your degree
51. Frequently asked questions
53. Contact us

UC is proud to partner with Ngāi Tūāhuriri and Ngāi Tahu to uphold the mana and aspirations of mana whenua.

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Kia ora

Nau mai ki te Pūtaiao. Welcome to Science at UC.

We’re excited to be with you on the first step towards your future.

You can pursue your interests, or you may discover a new one altogether, from the wide subject options available to you. Here’s all you need to know about starting your journey with us at Te Whare Wānanga o Waitaha | University of Canterbury — from planning your degree to understanding where your time at UC can take you personally and professionally.

Nā reira, kia tau mai tō waka ki UC i te tau kai te eke mai — tauti mai, rarau mai! Come and settle your waka (voyaging canoe) here — we look forward to welcoming you to our UC whānau in 2021!

Grace — TE AO MĀORI & SCIENCE
Te Āti Haunui-A-Pāpārangi
Studying towards a Bachelor of Science in Chemistry and Physics, and a Bachelor of Arts in Te Reo Māori with a minor in Māori and Indigenous Studies
Why Science?

The world is facing immense challenges. For every problem, science is helping us find solutions. Science needs curious, young minds with new ideas and approaches. Science needs people like you who want to make a difference.

Where can it take me?

A career in science is limited only by your own imagination. You could be anything — marine biologist, market analyst, psychologist, policy advisor, seismologist to aerospace engineer, and much, much more.
Where do I start?

A Bachelor of Science (BSc) is the first step to becoming a scientist. It can open doors to many other careers too. A BSc has lots of subjects to choose from, exposes you to new ideas and technologies, and gives you the skills and tools you’ll need to understand and influence the world around you.

Join your fellow dreamers, explorers, and innovators. Choose science and change the world.

Why UC Science?

At UC Science, you decide where you’re going — our job is to help you get there.

We offer heaps of options and flexibility, state-of-the-art facilities, amazing research opportunities (in the lab and the field), and passionate, world-recognised lecturers, who challenge students to look beyond the surface and what is known. Our campus is friendly, compact, and based just on the edge of Ōtautahi Christchurch.

Our 3-year BSc degree is hugely flexible and you can mix and match subjects across a range of disciplines. This allows you to explore a wide range of subjects, try things out, and see what you like before you specialise and progress in your career.

You can choose from 19 majors or minors, and courses from other subject areas, giving you the opportunity to design your own future.

Our qualifications

• Bachelor of Science BSc
• Bachelor of Speech and Language Pathology with Honours BSLP(Hons)
• Bachelor of Forestry Science BForSc
• Bachelor of Health Sciences BHSc
• Certificates
• Graduate and postgraduate options.

See pages 4–13 for our full list of qualifications.
Bachelor of Science. BSc

A Bachelor of Science (BSc) is about understanding and improving the natural world through observation, experimentation, modelling, and calculation.

As a BSc student, you’ll investigate the big issues confronting our planet including climate change, human health and diseases, the global water crisis, food security, environmental protection, and much more. A BSc will expose you to new ideas and technologies, develop your research skills, and help you make a real contribution to the challenges facing our world.

Recommended preparation
Provided you have entry to the University, all Science subjects can be started in the first year. However, previous study is recommended for some Science subjects, in particular Chemistry, Mathematics, and Physics. Some of these courses have entry requirements.

If you have not studied one or more of the required subjects, or did not achieve enough credits, but have University Entrance, you may consider taking a course from the Certificate of University Preparation.

You may be able to fast-track your degree and gain direct entry to the second year if you have excellent Year 13 results or a New Zealand Certificate in Science with outstanding merit.

Degree structure
The BSc degree requires a minimum total of 360 points:

- a minimum of 255 points of Science courses
- the remaining 105 points can be from either Science courses or courses from other degrees.

At least 225 points must be from courses above 300-level, with at least 90 points at 300-level.

Majors
For a major, you must complete all majoring requirements, including 60 points at 300-level in a single science subject (unless specified otherwise). A double major is possible in many subjects.

Minors
You may also choose to do a minor in Youth and Community Leadership, or from subject options within this degree, or Bachelor of Arts, Bachelor of Commerce, and Bachelor of Sports Coaching. A minor requires 75 points of courses, with 45 points above 100-level.

When choosing your first-year courses you should include courses that allow you to advance to 200-level in at least two subjects.

The BSc is very flexible, as well as the major subjects and endorsements offered, you can study courses such as Antarctic Studies, Forestry, Water Resource Management, and Health Sciences that count towards your BSc.

Double degrees
Many students combine the study of a BSc with another degree such as a BA, BCom, or LLB. Students considering this should seek advice from Te Rāngai Pūtaiao | College of Science Student Advisor and the advisors for the second degree.

Further study
If you have achieved top grades during your Bachelor of Science, you may be permitted to enter the BSc(Hons), which is an accelerated 12-month postgraduate degree.

The College offers a number of different postgraduate pathways available including the BSc(Hons), MSc, and PGDipSc, as well as qualifications that are more specialised and vocationally focused.

Career opportunities
A BSc sets you up to pursue a wide range of careers all over the world — from marine biologist to market analyst, psychologist to policy advisor, seismologist to aerospace engineer, and much more. It can open doors to many other careers, including business, politics, medicine, finance, and engineering. With a BSc, anything is possible.

www.canterbury.ac.nz/science
Follow your interests with the BSc

When it comes to choosing your subjects, the most important thing is to do what interests you. The examples below show how you might ‘build’ your BSc degree around specific areas of interest.

Astrophysics
Astrophysics is a branch of space science concerned with the physical nature of stars and other celestial bodies.

If you’re interested in this area of science, you could choose Astronomy as your major subject, with Physics, Mathematics, and Geography as additional subjects. This would be a BSc in Astronomy.

Climate change and sustainability
Climate change and sustainability are some of the biggest issues facing our planet. This area of science is helping us understand how things are changing, and what we can do to adapt. If you’re interested in this area of science, you could choose Geology as your major subject with Environmental Science, Water Resource Management, and Geography as additional subjects. This would be a BSc in Geology.

Forensic science
Forensic science uses scientific methods and processes to solve crimes, including gathering DNA evidence, fingerprint analysis, detailed examination of crime scenes, or the recovery of digital documents. If you’re interested in this area of science, you could choose Psychology as your major subject with Linguistics, Biochemistry, and Sociology as additional subjects. This would be a BSc in Psychology. Alternatively, you could major in Biochemistry with Chemistry, Psychology, and Biological Sciences as additional subjects. This would be a BSc in Biochemistry.

Bachelor of Science majoring in Astronomy
Year 1

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<tr>
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<th>ASTR 112</th>
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<th>PHYS 102</th>
<th>MATH 102</th>
<th>MATH 103</th>
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<th>COSC 122</th>
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Bachelor of Science majoring in Geology
Year 1

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<th>GEOL 113 or GEOL 115</th>
<th>CHEM 114 or CHEM 111</th>
<th>STAT 101</th>
<th>ENVR 101</th>
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Bachelor of Science majoring in Psychology
Year 1

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<th>PSYC 106</th>
<th>BCHM 111</th>
<th>BCHM 112</th>
<th>CMDS 100 Level</th>
<th>HRSV 103</th>
<th>HRSV 104</th>
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Bachelor of Science majoring in Biochemistry
Year 1

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<th>PSYC 106</th>
<th>BCHM 111</th>
<th>BCHM 112</th>
<th>CMDS 100 Level</th>
<th>CHEM 111</th>
<th>STAT 101</th>
</tr>
</thead>
</table>

University of Canterbury Mount John Observatory.
You don’t need have to have taken science at school to study it at university. While some subjects do require specific NCEA science credits for entry, and science experience is helpful, there are still subjects you can study with no formal science education.

Have a look at the table below and see if you fit the entry criteria for your chosen subjects. If not, don’t worry; we offer courses, training, and other options to help you catch up.

### BSc Majors

<table>
<thead>
<tr>
<th>Major</th>
<th>Biology</th>
<th>Chemistry</th>
<th>Physics</th>
<th>Calculus</th>
<th>Statistics</th>
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<tbody>
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<td>Linguistics</td>
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<td>Mathematics</td>
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<td>Medicinal Chemistry</td>
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<td>Statistics</td>
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</tbody>
</table>

All students must meet University Entrance requirements or their equivalent. All BSc majors recommend English language skills at NCEA Level 2, except Linguistics which recommends NCEA Level 3.

**Key**

- * Useful background
- ** Recommended background
- *** Required background
Careers in science

UC Science graduates are highly employable — our employers and graduates verify this.

Not only are there varied career opportunities for graduates, but the connections we have with industry at a local and national level means you will have the best start to your career.

Career opportunities

UC Science graduates are employed all over the world in exciting, challenging, and rewarding jobs. Here are some of the jobs our graduates are doing:

Research scientist
- designs and conducts research experiments
- analyses the data and results
- integrates traditional Māori knowledge and values in science
- supports sustainable Māori development and cultural aspirations through research
- publishes journal papers, files patents, and presents information at conferences.

Toxicologist, chemical consultant
- identifies toxic substances and evaluates potential harmful effects
- conducts laboratory and field experiments

Environmental scientist
- applies knowledge of atmospheric, water, and soil chemistry to the environment
- carries out field and lab tests, records data, conducts analysis and writes scientific reports
- connects Māori knowledge and values with environment research
- works between iwi and Government agencies to ensure mātauranga Māori is reflected in public policy and research.

Data analyst
- data scientist
- analyses past and current data
- makes predictions and provides insight
- acts as a bridge between IT experts and business analysts.

Entrepreneur and CEO
- develops an idea to form their own business
- gets involved in a start-up

Medical physics registrar
- operates and improves diagnostic and therapeutic equipment
- helps prevent, diagnose, and treat different diseases/conditions
- ensures radiology, nuclear medicine, and radiation treatments are safe and effective.

Geotechnical engineer
- advises on site selection using geological maps and aerial photographs
- advises landowners on risks and site selection for new housing or papakāinga developments
- uses specialised software to design structures
- advises on construction materials and testing.

Career support

Our Te Rōpū Rapuara | UC Careers team can help with all aspects of your career decision-making. They can help you with career planning and guidance, searching for a job or internships, connecting you with potential employers, and much more.

www.canterbury.ac.nz/careers
Bachelor of Speech and Language Pathology with Honours. BSLP(Hons)

Over the four years of this degree, students gain the knowledge and skills to assist a wide variety of people with communication and swallowing disorders.

The Bachelor of Speech and Language Pathology with Honours (BSLP(Hons)) is a highly regarded, professional degree accredited by the Te Kāhui Kaiwhakatikatika Reo Kōrero o Aotearoa New Zealand Speech-language Therapists’ Association (NZSTA). UC students are able to utilise excellent on-site resources including clinics and research facilities.

Recommended preparation

Entry into the Intermediate Year

The Intermediate Year is open to all students with University Entrance. A background in science is recommended.

Entry into the Professional Years

The first year is followed by the Professional Years. Entry into the Professional Years is limited and is based on completion of the Intermediate Year, academic merit (normally a B+ or better grade average), and fluency in English. Relevant work experience may also be considered. Applications for entry to the First Professional Year close on 1 October of the preceding year, although late applications will be considered if places are available.

If you are unsuccessful in gaining a place in the First Professional Year, your completed courses can usually be credited to a BSc, BHS, or BA.

Degree structure

The BSLP(Hons) requires a total of 480 points.

The Intermediate Year

The first year (Intermediate Year) comprises a minimum of 120 points or eight 15-point courses (or equivalent). The Intermediate courses may be taken in one full-time year of study or accumulated over more than one year.

The compulsory courses in your first year cover anatomy, physiology, and statistics. Students must also take one course in Māori culture, language, or health. The four recommended courses cover communication disorders, linguistics, and psychology.

The Professional Years

First Professional Year courses focus on speech and language development and disorders, evidence-based practice, and audiology. By working with a range of clients you will gain practical experience (which represents up to 25% of the year’s work).

In the Second Professional Year, you continue to study different types of communication disorders, work with practising therapists, and complete coursework in a hospital setting. This year your fieldwork increases to 30%.

In the Third Professional Year, you take more advanced courses and also complete research work. About half of your year will be based in the field, and you will spend more time taking responsibility for the assessment of clients and the planning, management, and evaluation of therapy programmes.

Further study

Postgraduate options include:

- Master of Audiology
- Master of Science (majoring in Speech and Language Sciences)
- Doctor of Philosophy (PhD).

Career opportunities

Our graduates are in demand and highly employable both in Aotearoa New Zealand and overseas. They go on to work in hospitals, schools, and private clinics. Some of our graduates now have their own private practices, while others are working in research labs, and designing and developing new speech-language technologies.

The BSLP(Hons) is recognised in Australia, the United Kingdom, Ireland, and Canada.

www.canterbury.ac.nz/careers

Te Kura Mahi ā-Hirikapo | School of Psychology, Speech and Hearing
T: +64 3 369 4333
E: psyc-speech-hear@canterbury.ac.nz
www.canterbury.ac.nz/science/schools-and-departments/psyc-speech-hear
A career where you can make a difference

All over the world there are people struggling to communicate, for many reasons — stroke, injury, illness, developmental delays, or even lack of confidence. Speech-language therapists help people recover, regain confidence, and reclaim their lives.

What is speech-language therapy?
Speech-language therapy is the treatment, support, and care of people who have difficulties with communication or swallowing. This may include difficulties with speech, language and cognition (thought processes), or physical processes.

Who needs it?
Communication difficulties can affect all types of people of any age and background, from new-born babies to the elderly. Speech-language therapy benefits people with autism, stuttering, or those who have suffered stroke, brain injury, or cancer.

Is this career for me?
If you are caring, patient, and enjoy helping people, then you would definitely make a good speech-language therapist. It helps if you are also interested in medicine and understand how the human body works.

Real-world experience
Study the BSLP(Hons) with us and gain first-hand experience in a real world environment. You’ll get to work directly with clients and alongside top clinicians and researchers at our on-site clinics and research centres, and in schools, hospitals, and more.

Our research centres and clinics:
• Swallowing Rehabilitation Research Laboratory
• Speech Production-Perception Lab
• Te Punahakaora Rehu Ohotata | Rose Centre for Stroke Recovery Research
• Te Reo o te Tamaiti | Child Language Centre
• UC Speech and Hearing Clinic.
We’re also affiliated with the New Zealand Brain Research Institute, and Te Kāhui Reo | New Zealand Institute of Language, Brain and Behaviour.

During your studies you’ll get to work with people of all ages at clinics in Aotearoa or overseas. You’ll graduate with skills and knowledge that can change lives.

Te Kura Mahi ā-Hirikapo | School of Psychology, Speech and Hearing
T: +64 3 369 4333
E: psyc-speech-hear@canterbury.ac.nz
www.canterbury.ac.nz/study
/subjects/speech-and-language-pathology

www.canterbury.ac.nz 9
Bachelor of Forestry Science (BForSc)

The Bachelor of Forestry Science (BForSc) is a professional degree offered by the Te Kura Ngahere | School of Forestry. It is an interdisciplinary degree that prepares graduates for managing forest resources by combining core science courses with management, commerce, and technology.

Small classes and field trips make for an engaging and rewarding learning experience at UC. Forestry Science graduates are highly sought after by employers and follow exciting and rewarding career paths.

Recommended preparation

The Bachelor of Forestry Science is open to all students who gain University Entrance. It is recommended that prospective students take NCEA Level 3 biology and maths, including statistics and probability — or the IB/Cambridge equivalent.

You may be able to fast-track your degree and gain direct entry to the second year if you have excellent Year 13 results or a New Zealand Certificate in Science with outstanding merit. It is possible to gain entry into the second or third year of study with a Bachelor of Science (BSc) or a New Zealand Diploma in Forestry with outstanding merit.

If you have not studied Year 13 statistics, or if you feel you have a weak background in these subjects, you should consider enrolling in a UC Headstart preparatory course over summer.

Degree structure

The BForSc requires a total of 480 points over four years. The first year provides a strong base in pure science, which is necessary for the professional study of Forestry Science.

First year courses cover a broad range of topics from trees, forests, and the environment to the commercial aspects of forestry and the importance of ecology, diversity, and conservation. First year electives can complement the degree or be of general interest to students.

In the second, third, and fourth years, you will then apply your knowledge to the forest situation, with elective options available in the third and fourth years.

It is possible to study the first year of the BForSc at other Aotearoa New Zealand universities. Students considering this option should consult Te Kura Ngahere | School of Forestry for their course selection, which would include FORE 102 Forests and Societies or FORE 105 Forests of the World (available by distance).

www.canterbury.ac.nz/regulations

Bachelor of Forestry Science – typical degree structure

Year 1

<table>
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<th>FORE 111</th>
<th>FORE 131</th>
<th>FORE 141</th>
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Year 3

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Year 4

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<th>FORE 419</th>
<th>FORE 422</th>
<th>FORE 447</th>
<th>FORE 414</th>
</tr>
</thead>
</table>

Each small block represents a 15-point course. Each large block represents a 30-point course.

Bachelor of Forestry Science with Honours

Students with a good grade average across 200 and 300-level courses may be invited to undertake honours as part of the fourth year of their degree. Honours involves the completion of a research course FORE 414 Dissertation.

Double degrees

You can combine the Forestry Science degree with the study of another degree, such as a Bachelor of Commerce (BCom) or Bachelor of Science (BSc) degree. Normally you can complete the two degrees in five years, but some degree combinations may take longer. It is also possible to complete a BCom degree with a strong Forestry emphasis. If you are considering a double degree you should consult Te Kura Ngahere | School of Forestry or Te Rōpū Takawaenga o UC | UC Liaison Office before enrolling.

There is also a Forest Engineering programme at UC, which students can study as a Bachelor of Engineering with Honours in four years.

Further study

UC offers a Postgraduate Diploma in Forestry for graduates looking to update or retrain, and a master’s and PhD for those who wish to advance their Forestry Science studies and research.

Career opportunities

UC students benefit from New Zealand Institute of Forestry meetings, lectures on campus, and summer work opportunities. Some of the biggest companies in Aotearoa hire UC graduates and many obtain work overseas.

Possible careers include forest management (plantation and native forests), iwi advisory, policymaking, conservation, harvesting, wood processing, forest science, timber appraisal, biosecurity, forest economics, and land management.

www.canterbury.ac.nz/careers

Te Kura Ngahere | School of Forestry
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E: forestry@canterbury.ac.nz
www.canterbury.ac.nz/engineering/schools/forestry
Bachelor of Health Sciences. BHSc

The BHSc is a three-year programme that provides a comprehensive overview of health and health care. It is a multidisciplinary qualification and our graduates are using their skills in the health sector and beyond.

Aotearoa New Zealand’s health and disability sector is characterised by a diverse workforce made up of many occupations. This diversity is essential to providing the range of services required to meet individual and public health outcomes.

This programme is based on world-leading research and provides the opportunity for internships in health-related workplaces.

Degree structure

- The BHSc requires a total of 360 points made up of 135 points from compulsory courses and at least 90 points from one subject major.
- The first year of study gives students a foundation in Health Sciences through core courses introducing students to health studies, human biology, epidemiology, and Māori health. Students will also undertake courses from their chosen major.
- At least 225 of the total points must be for courses above 100-level. In the second and third years of study, students will gain specialist knowledge in their chosen major.

www.canterbury.ac.nz/regulations

Workplace skills and knowledge

This degree will provide students with an awareness of the critical health challenges facing Aotearoa. Essential workplace skills will be gained in cultural competency and working with communities to improve health outcomes.

Students will graduate being able to evaluate quantitative, qualitative, and Kaupapa Māori information, equipping them for decision making in the workplace.

Bachelor of Health Sciences majors in Psychology – typical degree structure

### Year 1

<table>
<thead>
<tr>
<th>Level</th>
<th>Course</th>
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### Year 2

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<td>HLTH 202</td>
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<td>206</td>
<td>PSYC</td>
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<tr>
<td>200 Level²</td>
<td>PSYC</td>
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<td>200 Level⁷</td>
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### Year 3

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<tr>
<th>Level</th>
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<tbody>
<tr>
<td>200</td>
<td>HLTH 301</td>
</tr>
<tr>
<td>339</td>
<td>PSYC</td>
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<tr>
<td>344</td>
<td>PSYC</td>
</tr>
<tr>
<td>300 Level²</td>
<td>PSYC</td>
</tr>
</tbody>
</table>

- Compulsory courses
- Major courses
- Other courses from Health Sciences or other degrees

¹ From PSYC 207, 208, 209, 211, 213.
² From PSYC 331, 332, 340, 346, 348, 349.
Each small block represents a 15-point course. However, some courses may be 30 points (or more).

Some majors have different requirements. For full course requirements, go to www.canterbury.ac.nz/regulations

Graduating BHSc students who complete HLTH 312 Health Planning, Implementation and Evaluation are recognised by the Health Promotion Forum as meeting the foundation knowledge and understanding of Ngā Kaiakatanga Hauora mō Aotearoa | Health Promotion Competencies for New Zealand.

Further study

Students with a health-related undergraduate degree may apply for entry to postgraduate Health Sciences programmes. Students with the appropriate background may be able to apply for programmes in Counselling, Child and Family Psychology, and Nursing.

Career opportunities

The BHSc at UC is ideal preparation to equip students to work within the many non-clinical areas of health, health management, and health care. You will gain multidisciplinary skills and insights that are highly valued in these fields.

Health Sciences graduates work in settings such as district health boards, government ministries, local government, non-government organisations, Māori health providers, aged residential care, schools, primary care organisations, universities, and polytechnics.

www.canterbury.ac.nz/careers

Te Rāngai Ako me te Hauora | College of Education, Health and Human Development
T: +64 3 369 3333
E: educationadvice@canterbury.ac.nz
www.canterbury.ac.nz/education
Certicates and diplomas

Certificate in Science
If you are interested in science, but don’t wish to commit to full-time degree study just yet, you might consider the Certificate in Science.

The Certificate comprises a minimum of 60 points at 100 and/or 200-level and can be completed in six months full-time, or one to two years of part-time study. The Certificate in Science can be used as a stepping stone to the Bachelor of Science.

Certificate in Science — possible structure

<table>
<thead>
<tr>
<th>Level</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>100 or 200</td>
<td>TRNS 001</td>
<td>Academic Writing and Study Skills*</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 002</td>
<td>Te Uku: Perspectives on the history and political expansions of Aotearoa and the Pacific</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 003</td>
<td>An Introduction to Social Issues and Challenges</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 004</td>
<td>Teacher Education and Educational Studies</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 005</td>
<td>Exploring the Psychology and Biology of the Human Mind</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 006</td>
<td>Chemistry: An introduction to atoms, bonding, and reactions</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 007</td>
<td>Preparatory Mathematics</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 008</td>
<td>Fundamental Physics</td>
</tr>
<tr>
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<td>TRNS 009</td>
<td>An Introduction to Statistics and Probability</td>
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<td>TRNS 010</td>
<td>Digital Data: An exploration of the use and pervasiveness of data in a digitised society</td>
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<td>TRNS 012</td>
<td>An Invitation to Law</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 013</td>
<td>Special Topic</td>
</tr>
<tr>
<td>100 or 200</td>
<td>TRNS 017</td>
<td>Mathematics with Calculus</td>
</tr>
<tr>
<td>100 or 200</td>
<td>MATH 101</td>
<td>Methods of Mathematics</td>
</tr>
</tbody>
</table>

* Compulsory.

For the full requirements see the Regulations for the Certificate in Science.

www.canterbury.ac.nz/regulations

Te Rāngai Pūtaiao | College of Science
Contact number: +64 3 369 4141
E-mail: collegeofscience@canterbury.ac.nz

Te Rāngai Pūtaiao | College of Science
Contact number: +64 3 369 4141
E-mail: collegeofscience@canterbury.ac.nz

The certificate comprises four courses: TRNS 001 and three optional courses.

Programme structure and duration
The CUP programme helps students to develop the skills necessary for successful university study, including time management; oral and written communication; analytical, critical, and problem solving; and interpersonal, group, and teamwork skills.

In the February and July intakes, the core course TRNS 001 Academic Writing and Study Skills is delivered in partnership with Hagley College on the UC campus.

Māori and Pasifika students can study the core skills course on the University campus as part of the connective grouping — Te Waka Talanoa. An academic pathway will be designed around a student’s individual needs via another three courses that make up the CUP certificate.

While it is desirable to complete the CUP full-time in one 13 week semester, it is possible to study part-time. Distance/flexible options are also available. Students who want to enrol in one or more CUP courses are able to do so by enrolling in a Certificate of Proficiency Preparatory (COP PREP). A number of CUP courses are available through distance learning.

CUP courses
The certificate comprises four courses: TRNS 001 and three optional courses.

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* Compulsory.
Science is by nature an interdisciplinary area of study. In fact, some of our greatest discoveries have come about by combining science with new or different areas, such as arts or engineering.

You can combine your UC Science degree with other UC qualifications depending on your interests and ambitions.

You could combine your BSc with any of the following degrees:
- Bachelor of Arts
- Bachelor of Commerce
- Bachelor of Laws
- Bachelor of Engineering
- Bachelor of Product Design.

These are just some examples; there are many more degrees on our website to choose from. Combined degrees can be completed through our conjoint degree programme or as a double degree.

**Conjoint degrees**

Conjoint degrees are accelerated programmes for high-achieving students, which combine two degrees into a single bachelor degree in as little as four years.

The accelerated programmes require 60 points fewer than a double degree, as well as a minimum sustained grade point average (equivalent to a B+) and a higher workload at 135 points per year. Students must graduate in both degrees that are part of the conjoint at the same time. Conjoint programmes leading to a BProdDesign/BSc, BCom/BSc, or BA/BSc can be completed in just four years.

**Double degrees**

It is possible to combine a Science degree with other degrees; a Bachelor of Science and a Bachelor of Laws is a highly marketable combination. The Bachelor of Science also combines well with the Bachelor of Arts, Bachelor of Commerce, or the Bachelor of Forestry Science.

Normally you can complete the two degrees in five years, but some degree combinations may take longer.

If you are considering a double degree, you should get advice from the Science Student Advisor or Te Rōpū Takawaenga | Liaison Office.

* Subject to Te Pōkai Tara | Universities New Zealand CUAP approval, due July 2020.

**More information**

Careful course planning is necessary when you are planning on studying double or conjoint degrees, to avoid overload and to ensure all requirements for each degree are met. Contact the Liaison Office or a Student Advisor in each relevant College or School.

**Te Rāngai Pūtaiao | College of Science**

T: +64 3 369 4141
E: collegeofscience@canterbury.ac.nz
www.canterbury.ac.nz/science
Study Science at UC

UC is committed to strengthening your knowledge, transferable skills, and bicultural competence and confidence in order to help you make a real difference in society. Here is why UC Science is unique.

Applied learning

You will have hands-on learning experiences in lectures, labs, and at our field stations. You can ‘do’ science right from the first semester of your first year (page 16).

Student support

We value manaakitanga at Te Rāngai Pūtaiao | College of Science. We are committed to supporting you on your study journey and to help you succeed. There are many initiatives for students to navigate university life — from mentoring to essay or CV writing. We also offer specialised support services for Māori and Pasifika students. As a UC student you are part of our whānau, we will look after you (page 17).

Interdisciplinary approach

Contemporary science cuts across diverse domains and is constantly changing. An academically varied background allows you to see how things fit together to get results (page 18).

Purpose-built

UC’s laboratories, research centres, and field stations are internationally renowned. Added to this is a brand-new regional research centre, that embraces the Ngāi Tahu cultural narrative of Whatukura in its design, and ensures students are at the forefront of contemporary science. Learning spaces in the centre have state-of-the-art equipment in a modern teaching environment (page 19).
Living laboratory

Ōtautahi Christchurch and Waitaha Canterbury are a living laboratory where students can see science in action and the impact that it has on communities (page 20).

Flexibility

With a broad degree programme that gives you plenty of opportunities to specialise later on, UC Science fosters the flexible and knowledgeable graduate that employers are looking for (page 21).

Accessible experts

UC is the top university in the country for the proportion of researchers that teach, so you will be taught by scientists who are at the forefront of advances in their field (page 22).

Compact campus and city

Ōtautahi Christchurch is an accessible city with many businesses and research locations close by, and our campus is like a mini city (page 23).

Andre — STUDY. GAMING. TRAVEL.
Studying towards a Bachelor of Science in Computer Science, and a Bachelor of Arts in Japanese.

www.canterbury.ac.nz
Applied learning

You will be out and about — in lectures, labs, and at our field stations — right from the first semester.

Time to get practical
As well as extensive science laboratories, research hubs, and field stations, UC has:
• a new $216 million Rutherford Regional Science and Innovation Centre (see page 19)
• a high-performance computing facility
• on-site clinics
• 24-hour computer labs
• Te Puna Pūkaha me te Pūtaiao | Engineering and Physical Sciences library.

First in the field
You will have plenty of chances to test out your knowledge, with UC field stations around Aotearoa New Zealand and beyond.
• Our courses make extensive use of the field stations in Cass and Kawatiri Westport.
• Field facilities are utilised in Te Mata Hápuku Birdlings Flat and Te Iringa o Kahukura Cashmere in Ōtautahi Christchurch.

Influence the world around you
A BSc will expose you to new ideas and technologies, develop your research skills, and help you work out how to influence the world around you. Internships and projects on issues such as climate change, human health, the global water crisis, food security, and environmental protection, are an ideal way of solidifying learning and effecting change on topics you are passionate about.

Improve people's lives
Did you know that UC students can solve real-world problems in on-campus clinics? Those studying Speech and Language Pathology, Linguistics, and Psychology can apply their learning in these clinics to help real people.

‘Studying science has not only helped in practical terms — like being able to formulate products and carry out clinical trials — but it also taught me how to evaluate sources, read studies, think critically, and look at all options before making a decision. I’ve been able to use the skills I have to create a business that has a positive, tangible effect on the environment and that feels amazing.

I’m passionate about the values my company stands for and the change we’re creating in the world. I’m insanely proud that we’ve prevented more than 130,000 bottles from being made and disposed of — our next goal is one million.’

Brianne
Entrepreneur, biochemist, and founder, Ethique Beauty
Bachelor of Science in Biological Sciences
Student support

We have many initiatives to help you navigate university life.

A little advice can go a long way
When you join UC it’s the start of a relationship. We walk alongside you as you progress through your studies, and we take pride in your success. Our academic advisors, UC Māori at Te Tari o te Amokapua Māori | Office of the AVC Māori, and the Pacific Development Team provide all the support you need. Our strong alumni network and connections with employers and researchers throughout Aotearoa and overseas add even more value to your UC experience.

And don’t forget the expert lecturers or technicians on hand — many are award-winning teachers and they are keen to help you progress your knowledge. See page 22 for more.

What can a Science Student Advisor help you with?
• Degree planning, including double degrees and double majors
• Explaining your course options
• Understanding degree regulations
• Advice on eligibility to graduate
• Cross-crediting between degrees
• Transferring between degrees or universities
• Exemptions, such as waivers of pre-requisites or core-requirements.

Other support services on offer
UC offers many services that can help you to flourish personally and academically:
• mentoring
• Pacific student support
• Ākonga Māori | Māori student support
• Te Pokapū Pūkenga Ako Academic Skills Centre
• Te Ratonga Whaiwhai | Equity and Disability Service
• Te Rūpū Rāpurara | UC Careers
• Ākonga tū, ākonga ora UC Students’ Association
• Atawhai Ākonga | Student Care advice
• Te Whare Hākinakina | UC Rec & Sport
• Te Whare Hauora | UC Health Centre.

2,500 students were seen face-to-face by a Science Student Advisor in 2019

‘I enjoy studying at UC because the department is so close-knit and the lecturers and professors have so much experience in the speech therapy field to share with the students. My degree is also very well structured and we get a lot of hands-on experience through clinical placements.

I really enjoy building new relationships and rapport with all my clients. What makes me love my future profession as a speech and language therapist is being able to improve my clients’ quality of life so the issues they acquired do not stop them enjoying life to the fullest.’

Stephanie
Studying towards a Bachelor of Speech and Language Pathology with Honours
Interdisciplinary approach

Modern science needs interdisciplinary collaboration, to see things differently and get results.

So many study options
Studying a UC Science degree means you can explore a wide range of subjects, from Antarctic Studies and Astronomy, to Physics and Psychology — see pages 24–49.

The interdisciplinary approach to science at UC creates more potential pathways and enables you to delve deeper or broaden your studies, depending on your study or career goals.

Our Student Advisors can help you work out how to juggle a double degree, endorsements, double majors, and other combinations — see page 53 for contact details.

Working side by side
Our modern Rutherford Regional Science and Innovation Centre will see staff and students from multiple disciplines working alongside each other on projects to create new connections. UC is the only Aotearoa university that will be able to deliver science in this way.

We have a strong tradition of research collaboration, with research centres and other entities uniting people from different disciplines within UC, nationally, and globally.

Exciting careers ahead
Interdisciplinary learning opens up roles in science that are contemporary, relevant, and exciting. Depending on your chosen subject, you could become a toxicologist or a food technician, a meteorologist or a marine biologist, a psychologist or a policy advisor, a Māori liaison or business development consultant, a software engineer, or a science writer.

‘One of the things that surprised me is the number of positions that a science degree opened up. It was the critical thinking and analytical skills, rather than the direct information that I learnt in the degree, that was most useful. This has meant I’ve had a wide range of jobs from R&D at Resene Paints to working with engineers to collect detailed building safety information after the earthquakes, and now working with an interdisciplinary team of physicists, computer scientists, and radiologists.’

Hannah
Bachelor of Science in Biochemistry and Biological Sciences
Master of Science in Biochemistry
PhD in Biochemistry
Scientist — Sales and Application Support, MARS Bioimaging Ltd.
Purpose-built

What you see is not just brick and mortar — our unique cultural narratives are woven into our learning spaces, to reflect the ideology of the University and the mana of Ngāi Tūāhuriri as our mana whenua.

State-of-the-art learning environment

In 2017, our extensive facilities were boosted further with the opening of the $216 million Rutherford Regional Science and Innovation Centre (RRSIC), with the name Whatukura given for its central atrium, inspired by the Ngāi Tahu narrative about Tāwhaki, who ascended the heavens in the pursuit of knowledge.

Most recently, the opening of the Beatrice Tinsley building marked the completion of RRSIC. This is an exciting space where staff and students can collaborate and grow their scientific knowledge about Aotearoa and the world.

Our students in Geography, Geology, Chemistry, Physics, Astronomy, Biochemistry, Ecology, and Biological Sciences will benefit from the most modern university science and research facilities in the southern hemisphere.

Psychology and Linguistics students benefit from modern computer laboratories, digital tools, equipment for animal behaviour, and neuroscience research and teaching.

Speech and Language Pathology students have excellent resources including 8 on-site clinics.

Catering for today’s learners and tomorrow’s leaders

The RRSIC is dynamic and adaptable to the diverse needs of today’s learners. The Centre has been purposefully designed to encourage innovation and support flexible learning and teaching methods with:

- state-of-the-art laboratories
- built-in technologies
- informal social and study spaces.

It enables easy interactions between departments, face-to-face teaching, individual and small-group investigative laboratory work, online research, and learning either individually or in groups.

‘All the fresh new buildings and facilities are great from a student’s perspective. On top of that, there are so many trees and gardens around campus to check out and get your mood up when you need a break. There’s no other university in New Zealand with a community like it.

I was worried about studying Physics because I didn’t excel in high school, but I’ve managed to do alright and I’m sure you will too! Don’t underestimate yourself. You’d be surprised what you can achieve when you put your mind to it.’

Luke
Certificate of University Preparation
Studying towards a Bachelor of Science in Economics and Physics
Co-founder, Vxt
Living laboratory

There is no better place to experiment and see impact than Ōtautahi Christchurch and Waitaha Canterbury.

Discover the sea and stars

Te Moana-nui-a-Kiwa Pacific Ocean or Kā Tiritiri-o-te-moana Southern Alps, an ancient volcanic peninsula, or an agricultural plain — these are some places your course may take you. Whether you’re in native bush, a glacial lake, or an International Dark Sky Reserve, this is your Waitaha Canterbury classroom.

The region is full of contrast and excitement. It’s home to the highest point of Aotearoa, the spectacular Aoraki Mount Cook, as well as deep sea marine life in the submarine trenches off the coast of Kaikoura.

Ōtautahi Christchurch has a history of involvement in Antarctic exploration — both Robert Falcon Scott and Ernest Shackleton departed from Ōhinehou Lyttelton port. As a UC student, these locations are where you will test hypotheses and discover new truths. And some of these places are within two minutes of campus.

Transformation and emergence

The Waitaha Canterbury earthquakes have provided an unprecedented opportunity to rethink and renew a city. Ōtautahi Christchurch is a living lab for scientists to study emerging aspects of science and challenge old ways of thinking.

Te Mahere Maraka Ōtautahi | The Christchurch Central Recovery Plan aims to improve the social, economic, cultural, and environmental wellbeing and resilience of greater Ōtautahi Christchurch and its communities. From research on biodiversity to technological innovation, brain research to economic revival, UC scientists have been at the forefront of the rebirth of Aotearoa New Zealand’s most modern city.

Across disciplines, UC students have applied their knowledge in this real-world context through internships, research projects, fieldwork, and community-based initiatives (see page 16 for more information on applied learning).

‘I realised that Geography was my ideal field of study as it’s broad and allowed me to combine my interests in the environment, technology, the outdoors, and the world around me. Since then I’ve met some of my best friends, worked with interesting lecturers, and have been on great field trips.

In one of my courses we had to connect with community partners that needed research done — my group worked with the Avon-Ōtākaro Network to help them plan their biodiversity monitoring. You learn how to work with real people and at the end you feel like what you’ve done could have a real impact.’

George

Bachelor of Science in Geography with an endorsement in Environmental Science
Bachelor of Arts with Honours in Geography
Co-creator, Kea Database
Master’s student, Sciences Po (l’Institut d’Études Politiques de Paris)
Explore a range of options

Our 3-year Bachelor of Science (BSc) degree is hugely flexible and you can mix-and-match subjects across a range of disciplines. This allows you to explore a wide range of subjects, try things out, and see what you like before you specialise and progress in your career.

You can choose from:

- 19 major or minor subjects
- 32 disciplines in total
- endorsement pathways
- double major pathways or even a double degree — see page 13.

Find out about topics as diverse as artificial intelligence or risk and resilience, biotechnology, or science education.

You're not on your own

We understand that it can be hard to decide what to study and you may want to keep your options open, particularly in your first year. We give students the ability to try different things so you can work out what you want to do, all the while offering guidance so you remain on track. Our dedicated Science Student Advisor can help you to explore your options and make decisions that are right for you.

The value of science graduates

The benefit of a generalist degree like a BSc is that students gain transferable skills applicable within a range of industries, scientific and otherwise. A broad degree can open up career options. There are also expanding opportunities in new science and technology.

‘UC provided the courses I needed and was interested in most, with the bonus of being my local university, and I was able to take advantage of the Canterbury region for my science studies.

After completing my undergraduate degree, I found that I had also developed a passion for educating young minds and passing on my passion for chemistry. I went on to become a registered teacher and now I get to shape the lives of young people and help them discover how amazing chemistry is. We also get to do exciting experiments (which often involve explosions!). I think humour is essential in the classroom, as well as being flexible.’

Matt
Bachelor of Science in Chemistry
Graduate Diploma in Teaching and Learning (Secondary)
Teacher, Middleton Grange School
**Accessible experts**

Black holes, restoring waterways, geospatial tools... we are a research-intensive university.

**Learn from the best**

The discoverer of a new species of plant in the Philippines; the expert who advised on a spider sequence in a BBC Attenborough series; the recipient of the Distinguished New Zealand Geographer Award; the scientist finding planets around other stars in our galaxy; the architect of the Sustainable Seas National Science Challenge; and the brains behind Te Papa and Wētā Workshop’s exhibition BugLab — you could be taught by these people during your time at UC.

**Highly ranked**

UC is in the top 100 universities in the world in Linguistics; top 150 in Earth and Marine Sciences, and Geography; and top 200 in Environmental Sciences (QS World University Rankings by Subject, 2020).

UC is overall third in Aotearoa for research intensity of its academic staff, ranking first in ecology, evolution and behaviour; marketing and tourism; political science, international relations and public policy; and public health (Te Amorangi Mātauranga Matua | Tertiary Education Commission 2018 PBRF assessment).

UC has the country’s top-rated Biological Sciences research school, and our geologists are world leaders in earthquake studies.

**World leaders who teach**

Many receive international and national awards for the quality of their teaching.

‘It’s really important to understand how humans interacting with the environment affects the trajectory the environment will take.’ — Ecologist Jason Tylianakis, 2019 UC Research Medal recipient.

‘[I am] driven by a love of volcanoes and fuelled by experiments and projects that are fun, exciting and important to society.’ — Volcanologist Ben Kennedy, 2019 UC Teaching Medal recipient.

‘My teaching focuses on interactive activities that help students understand how natural systems work while stimulating their curiosity to learn more.’ — Glaciologist Heather Purdie, 2019 Tertiary Teaching Excellence Award winner.

‘I enjoyed the collegial attitudes of the staff and students that I worked with at UC. Everyone was very supportive, both in an academic and a personal sense, and I have made some lifelong friends.

My studies taught me to ask questions that get to the heart of the problem and look for analytical solutions. I picked up coding skills during my MSc and PhD degrees and these skills underpin all of my current work.

My jobs have taken me to some amazing places — from deepest Fiordland to Antarctica, to work with species such as kākāpō, takahē, whio, and Adélie penguins.’

**Amy**

PhD in Ecology
Quantitative Freshwater Ecologist,
Tahoro Nukurangi | National Institute of Water and Atmospheric Research

---

**Experts from around the world**

75 experts from around the world come to teach and collaborate at UC each year through the Erskine Fellowship programme.
Compact campus and city

UC’s single campus connects you to a broad scientific, business, and other interdisciplinary communities.

One place – many connections

An Innovation Hub in the new Rutherford Regional Science and Innovation Centre (RRSIC) will foster connections with industry. Students will be able to build knowledge and networks while working on projects of significance. This will ensure our graduates enter the workforce with work-ready skills and the knowledge employers need.

UC has connections with many organisations within Waitaha Canterbury’s key industries. They attend careers fairs on campus, offer work experience, collaborate on projects, take part in research, give guest lectures, and recruit UC graduates.

A campus for the curious

A bustling campus with over 87 hectares of park-like surroundings, UC has plenty of learning spots for the scientifically inclined. Students can be found testing pH levels in Kā Waimaero Ilam Stream waterway, growing specimens in the hydroponic gardens, analysing the campus layout geospatially, conducting psychological surveys, admiring the rock and gem collection, or using the new MARS scanner.

In addition to UC’s world-class laboratories, libraries, and equipment, there are over 15 recognised science research centres, institutes, and hubs based at UC.

‘I really enjoyed the campus, student lifestyle, the city, the range of courses, the lecturers, and my fellow students who encouraged me to perform to my best. Being able to come in and use the labs at any time really helped to get the finishing touches on some of the more complex assignments.

By far, my favourite memories were the field trips I took to UC’s various field stations as part of my Geology and Geography studies. A lot of hard work and a lot of fun was had on these trips! If you’re the outdoorsy type, then Christchurch is the place for you.’

Hamish
Postgraduate Diploma in Geographic Information Science
Consultant Developer, Interpret Geospatial Solutions
Science subjects are like the building blocks of your degree. In your first year of study, for most of our degrees, you’ll need to choose one or two major subjects and at least four others. Together, these make up your degree.

Have a look through some of the subjects on the next few pages and see if there are any that interest you. See our full list of subjects at www.canterbury.ac.nz/study/subjects

25 Antarctic Studies  
25 Astronomy  
26 Biochemistry  
27 Biological Sciences  
28 Biosecurity  
29 Biotechnology  
29 Chemistry  
30 Computer Science  
32 Data Science  
32 Ecology  
33 Economics  
40 Environmental Health  
33 Environmental Science  
34 Finance  
34 Financial Engineering  
36 Forestry Science  
37 Geography  
38 Geology  
40 Health Education  
39 Health Sciences  
41 Linguistics  
40 Māori and Indigenous Health  
43 Medicinal Chemistry  
44 Philosophy  
44 Physics  
46 Psychology  
41 Public Health  
41 Society and Policy  
47 Speech and Language Pathology  
49 Statistics
Antarctic Studies
BA, BSc (not a major or minor subject at undergraduate level)

Of all places in the world, none holds the fascination and awe of Antarctica. Not only is Antarctica the highest, coldest, and most isolated continent, but it is so vast it affects the world’s climate and ocean currents. If the ice sheets were to melt, as is currently predicted in many climate models, the sea would rise up to 70 metres above current levels. The Antarctic and surrounding Te Moana-tāpokopoko-a-Tāwhaki Southern Ocean support a unique and complex system of life that survives in an environment at the extremes.

However, Antarctica has not always been the cold, isolated, polar continent it is today. In the past, it has experienced warmer climates and was linked to other continents, most notably as part of Gondwana. The fragmentation of that supercontinent shaped the southern continents as we know them today. Many of Aotearoa New Zealand’s and the Southern Hemisphere’s unique plants and animals had their origins in Gondwana.

Why study Antarctic Studies at UC?

- Antarctic Studies courses are coordinated by Gateway Antarctica, the Centre for Antarctic Studies and Research at Te Whare Wānanga o Waitaha | University of Canterbury.
- Gateway Antarctica plays a leading role in the quest for knowledge in a diverse range of national and international Antarctic research projects, in areas including engineering in extreme environments; Antarctica as driver of, and responder to, climate change; connections between Antarctica and Aotearoa New Zealand; and human influences in/on Antarctica.

Recommended background

Anyone eligible to attend university may enrol in 100-level Antarctic Studies courses.

100-level courses

<table>
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<tr>
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<td>ANTA 102</td>
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While you cannot major in Antarctic Studies as an undergraduate student, you can take ANTA 101 or ANTA 102, and ANTA 103 as part of any degree. ANTA 102 and ANTA 103 are half-year courses and you can choose to take one or both. ANTA 101 is offered as a fully online summer school course.

200-level and beyond

ANTA 201 Antarctica and Global Change is a course that requires ANTA 102 and ANTA 103, or ANTA 101, as prerequisites, building on the information from those two courses. It is intended for BSc students with a strong interest in Antarctica and explores links between the Antarctic atmosphere, hydrosphere, cryosphere, lithosphere, and biosphere. This course also considers how Antarctica will respond to global change.

Antarctic Studies forms a significant component of some courses from other disciplines, including GEOL 480 Geological Evolution of NZ and Antarctica, and LAWS 336 Antarctic Legal Studies.

Career opportunities

An in-depth knowledge of Antarctic issues can form a useful part of many careers in science, politics, tourism, education, and law. There are a large number of people who visit the Antarctic every year, many of whom are scientists specialising in areas such as geology, glaciology, biology, astronomy, and environmental management.

To make their day-to-day operations run smoothly, a range of staff are employed by national Antarctic programmes — from engineers to plant technicians, finance personnel to communication managers.

Having a degree and some background knowledge in Antarctic Studies will give you a greater opportunity to visit and work in Antarctica. It provides you with information on global systems that is becoming fundamentally important in many non-Antarctic jobs such as science technicians, IT specialists, and law or policymakers. The important role the polar regions play as drivers of the world’s climate will be a major consideration in many careers in the coming years.

www.canterbury.ac.nz/careers/students/subjects

Te Kura Aronukurangi | School of Earth and Environment
T: +64 3 369 0655
E: earthandenvironment@canterbury.ac.nz

Astronomy
CertSc, BSc, BA (minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

Astronomy and astrophysics are concerned with the study of the nature and distribution of matter and radiation throughout all time and space in the Universe. Astronomers have always been keen to harness the latest technological advances in their quest for ever more precise and revealing observations. As a consequence, astronomy in recent years has been one of the most rapidly expanding of all physical sciences and many exciting and unexpected discoveries continue to be made.

Why study Astronomy at UC?

UC is the only university in Aotearoa New Zealand to offer the study of Astronomy at all levels.

Te Kura Matū | School of Physical and Chemical Sciences has an exciting programme of teaching and research, often using state-of-the-art facilities as part of its core work. These include:

- field stations for meteor and atmospheric research, which are located at Te Mata Hāpuku Birdlings Flat, and at Scott Base, Antarctica
- an internationally important astronomical observatory at Ōtehiwai Mount John, Takapō Tekapo, equipped with computer-controlled instruments and cryogenic detectors
- UC-constructed Hercules, a high resolution spectograph to search for planets and do improved stellar astrophysics.

The School collaborates nationally and internationally as well. For example, we have a collaboration with Nagoya University in Japan, who installed a 1.8 metre telescope at Ōtehiwai Mount John for finding planets orbiting distant Milky Way stars.

The Ōtautahi Christchurch Aerospace Strategic Plan aims to make the city the centre of Aotearoa New Zealand’s aerospace technology sector by 2025, which will extensively use UC’s facilities and research programmes, and offer students internships and other entrepreneurial opportunities in the industry.

UC is ranked in the top 250 universities in the world for Physics and Astronomy (QS World University Rankings by Subject, 2020).

Recommended background

Year 13 mathematics and physics are strongly recommended for ASTR 112.

Certain courses require a background in Year 13 physics and calculus.

100-level courses

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www.canterbury.ac.nz/careers/students/subjects

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Students intending to advance in Astronomy are required to include in their first-year courses: ASTR 112, PHYS 101, PHYS 102, MATH 102, MATH 103, and either MATH 170, COSC 121, or COSC 131.

200-level and beyond

At an advanced level, Astronomy is heavily based on physics. Students intending to pursue study in Astronomy must first and foremost obtain a good grounding in Physics and Mathematics. The courses ASTR 211 Imaging the Universe and ASTR 212 Dynamical Astronomy and the Solar System are taught in alternate years in the second semester. ASTR 211 covers computer image processing, astrometry, photometry, and spectroscopy. ASTR 212 covers solar system astronomy and dynamic astronomy. Students in their first year can undertake these courses once they have completed a first-semester prerequisite.

At 300-level (BSc) and 400-level (honours and master’s), courses cover the detailed structure and evolution of stars, galaxies, and the Universe.

www.canterbury.ac.nz/courses

Career opportunities

Students majoring in Astronomy acquire a wide range of skills, from the use of spectroscopic and photometric detector systems (and the analysis of the data obtained), through electronics and optics, to computer skills for analysis and interpretation of data. This produces a graduate who is well equipped to undertake employment not only in astronomy, but in any number of fields that require practical experience or that involve analysis of real data.

Studying Physics and Astronomy equips graduates with skills in problem solving, abstract thinking, evaluating, communicating, and decision making. It develops high levels of curiosity, inventiveness, and mathematical and computer competencies.

Graduates may follow traditional paths and work either as scientists, technicians, research assistants, engineers, astronomers, patent agents, technical authors, or even managers at an observatory or in an institute. However, many Astronomy graduates move into other fields, particularly computing and information technology, management, and science communication or media work. With some additional study, graduates can become meteorologists, geophysicists, material technologists, or medical physicists.

www.canterbury.ac.nz/careers/students/subjects

Biochemistry brings together a number of branches of science with a view to understanding the chemistry of life. Such a unique and privileged position at the interface of the traditional sciences makes for a dynamic and exciting discipline. It provides basic insight into biological processes such as enzyme action, drug action, genetic engineering, photosynthesis, and colour vision.

Biochemistry is at the cutting edge of contemporary science, research, and industry. Biochemical innovation is critical in adding value to Aotearoa New Zealand’s agricultural production, advancing medicine, and understanding the fundamentals of the biological world around us.

Some knowledge of Biochemistry is useful in many areas of Chemistry and for any student studying Biological Sciences.

Why study Biochemistry at UC?• The Biochemistry Centre at UC is a joint venture of Te Kura Matū | School of Physical and Chemical Sciences, and Te Kura Pūtaiao Koīanga | School of Biological Sciences, which brings together award-winning teachers in a coordinated Biochemistry programme.
• The Biomolecular Interaction Centre is a collaborative research centre with state-of-the-art equipment that features direct ties to other universities and to industrial research organisations.

Recommended background

A background in Year 13 biology and chemistry is strongly recommended.

100-level courses

First-year students intending to study Biochemistry need to take BIOL 111 Cellular Biology and Biochemistry and BCHM 112 Structure and Reactivity in Chemistry and Biochemistry as these courses are prerequisites for advanced Biochemistry courses. BIOL 112 Ecology, Evolution and Conservation, BIOL 113 Diversity of Life, and CHEM 111 Chemical Principles and Processes are also recommended.

Students with fewer than 14 NCEA Level 3 credits in chemistry (or equivalent) should also take CHEM 114 Foundations of Chemistry.

Te Kura Matū | School of Physical and Chemical Sciences
T: +64 3 369 3100
E: physical-chemical-sciences@canterbury.ac.nz
www.canterbury.ac.nz/science /schools-and-departments/phys-chem /astronomy

Biochemistry
CertSc, BSc, BA (minor only), BCom (minor only), BSpC (minor only), BVCL (minor only)

‘I have always had an interest in science and through high school, biological sciences were a personal favourite. I love seeing the inner mechanisms of life and how they interact at the molecular level. The idea that we are all made from the same tiny building blocks that together form something as complex as a human is fascinating.

UC has one of the best schools of biology in the country and combined with the location and my degree choice, it just made sense. I love the practical applications of the theory we learn.’

Caleb
Studying towards a Bachelor of Science in Biochemistry
Biological Sciences
CertSc, BSc, BA (minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

Biology means the study of living things. Biologists investigate animals, plants, and microbes in many different ways, and on a huge range of scales from molecules and cells to individual organisms, populations, and ecosystems.

During the past few decades, the study of biology has undergone rapid change and has had a significant impact on the way we live. We are now able to produce antibiotics and vaccines, grow disease-resistant crops, transplant organs, and manipulate genes. Biologists today are actively researching solutions to vital concerns such as increasing world food supply, improving and protecting our environment, and conquering disease.

We need to know how microorganisms, plants, and animals work and how they interact on land and in the sea and fresh waters. Of increasing importance to us is global climate change and how this affects the living world.

Why study Biological Sciences at UC?
Our courses will help prepare you for a career in biology, be it in biodiversity, biosecurity, or biotechnology. Our lecturers are all actively engaged in research on diverse and exciting topics. These range from those of practical and economic importance to Aotearoa New Zealand society, to those probing the boundaries of fundamental, interest-driven science.

Te Kura Pūtaiao Koiora | School of Biological Sciences has modern, well-equipped teaching and research laboratories with excellent technical support. The full suite of molecular biology and biochemistry equipment includes:
• a real-time polymerase chain reaction machine (or DNA amplifier)
• an automatic DNA sequencer
• a confocal microscope
• tissue culture and image processing facilities
• controlled plant growth chambers
• an experimental garden and glasshouse complex
• an extensive computer network.

UC is ranked 223rd in the world for Natural Sciences (QS World University Rankings by Subject, 2020).

200-level and beyond
At 200-level, the Biochemistry programme consists of biochemistry (BCHM 222 Metabolism; the Reactions of Molecules in Cells) together with related chemistry and biology courses and also the lab course (BCHM 281 Practical Biochemistry).

At 300-level, Biochemistry courses deal with advanced biochemistry, biological chemistry, biochemical and environmental toxicology, and important biochemical techniques.

www.canterbury.ac.nz/courses

Career opportunities
Biochemists are key members of drug development teams in the pharmaceuticals industry. Many work in government departments (e.g., in medicines regulation), diagnostic departments in hospitals, and in research institutes studying subjects as diverse as crop protection and nanotechnology.

You could find interesting graduate jobs and career progression with food and beverage producers; agricultural organisations; manufacturing and processing companies; the biotechnology industry; health and beauty care organisations; or science publishers.

Graduates with Biochemistry in their degrees are also well equipped to teach biology, chemistry, and other science subjects in secondary schools.

I have taken part in several field trips to Cass, Governors Bay, Kaikōura, and now my own research takes place in Tekapo. I’d recommend going on as many field courses as possible. They are so much fun, and you learn way more being in the environment you’re studying than you would from a textbook.

I love the undergraduate programme structure, which allowed for a huge focus on your major and didn’t require taking unnecessary courses.

I also love how inclusive and tight-knit the Biology Department is. I always felt comfortable going to talk to lecturers in their office. ’

Morgan
Bachelor of Science in Biological Sciences with an endorsement in Ecology
Studying towards a Master of Science in Biological Sciences

Te Kura Matū | School of Physical and Chemical Sciences
T: +64 3 369 3100
E: physical-chemical-sciences@canterbury.ac.nz
www.canterbury.ac.nz/science
/schools-and-departments/phys-chem
/biochemistry
Out in the field
Teaching and research activities are greatly enhanced by access to field stations. Many undergraduate courses involve a fieldwork component based at Cass in Kā Tiritiri-o-te-moana Southern Alps. Field trips allow students to apply techniques and hypotheses they have learnt in lectures and to interact with staff in a more informal setting.

Recommended background
Year 13 biology, statistics, and chemistry are strongly recommended. For certain topic areas, some knowledge of physics is helpful. All students should have adequate English skills.

100-level courses
Of the five first-year courses, three — BIOL 111, BIOL 112, and BIOL 113 — are foundation courses and are required in order to advance in Biological Sciences. Introductory Statistics (STAT 101) is also required at 100-level to advance in Biological Sciences.

Some of these courses also form part of the Intermediate requirements for Forestry. Students who have not taken chemistry to Year 13 level are strongly advised to take one Chemistry course (eg, CHEM 114 Foundations of Chemistry).

Career opportunities
Our graduates have gone on to positions as teachers, technicians, researchers, and managers; and diverse other careers in agriculture, horticulture, veterinary and medical science, freshwater and marine fisheries, aquaculture, oceanography, entomology, soil biology, and food, brewing, and pharmaceutical industries.

Government agencies frequently target Biological Sciences graduates. Regular employers of our graduates include Crown Research Institutes, government ministries concerned with conservation, the environment, agriculture, forestry, and health, and regional and local councils.

A Biological Sciences degree indicates you have the ability to access, understand, analyse, and communicate complex information. This is attractive to many employers.

Biosecurity

BA (not a subject major or minor), BSc (as an endorsement)

Biosecurity concerns the exclusion, eradication, and effective management of threats to the economy, environment, and human health that are posed by pests and diseases. Aotearoa New Zealand’s economy and trade rely on a strong primary production base, and our freedom from major pests and diseases is critical to producing efficiently and trading freely.

Ongoing global climate change and its effects on ecosystems make understanding biosecurity issues crucial. As our climate alters, organisms previously unable to survive in our environment may become a potential threat to our ecosystem.

Recommended background
Year 13 biology is recommended. Some background in mathematics, particularly statistics and chemistry, is valuable. All students should have adequate English skills.

100-level courses
If you want to study towards a Bachelor of Science with an endorsement in Biosecurity, you will need to take the following courses in your first year, and combine it with the Biological Sciences major:

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<td>BIOL 116</td>
<td>Human Biology</td>
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<tr>
<td>SCIM 101</td>
<td>Science, Māori and Indigenous Knowledge</td>
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If you wish to advance in Biological Sciences, you will also need to include STAT 101 Statistics 1.

200-level and beyond

Students enrolled in the BSc with an endorsement in Biosecurity will study BIOS 201 Issues in New Zealand Biosecurity at 200-level (as well as other required courses listed in the Biosecurity endorsement schedule). This course establishes a scientific, legal, and practical definition of biosecurity and pursues the ramifications of breaches to the systems in place to protect Aotearoa from such threats to our security.

Students studying other degrees, such as the Bachelor of Arts, can take BIOS 201 as part of their degree, plus the Biological Sciences course BIOL 273 New Zealand Biodiversity and Biosecurity.

All students majoring in Biological Sciences must take BIOL 209 Introduction to Biological Data Analysis.

Career opportunities
As an emerging issue of both national and international importance, biosecurity provides many career opportunities in government agencies; spearheaded by the regulatory authority the Ministry for Primary Industries Manatū Ahu Matua. You may also find work in Crown Research Institutes and in ministries concerned with conservation, the environment, agriculture, and forestry.

District and regional councils also may employ biologists to manage invading organisms.

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Recommended background
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Recommended background
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Biotechnology
BSc (as an endorsement)

Biotechnology is of national and international importance. It considers and develops knowledge about biochemical, molecular, ecological, and evolutionary processes. Biotechnology tools are applied in research underpinning biodiversity and biosecurity throughout Aotearoa New Zealand.

Biotechnology research is directed towards developing technology with both economic and environmental outcomes. The OECD has predicted that, by 2030, biotechnology will assume a major role in the global economy with the advances from research in the tertiary sector.

Te Kura Pūtaiao Koiora | School of Biological Sciences offers the Bachelor of Science endorsed in Biotechnology to students majoring in Biological Sciences. Students follow one of two pathways:
- environmental biotechnology
- plant biotechnology

**Recommended background**

Year 13 biology, statistics, and chemistry is strongly recommended. Some knowledge of physics is also helpful.

All students should have adequate English skills.

**100-level courses**

If you want to study towards a Bachelor of Science with an endorsement in Biotechnology, you will need to take the following courses in your first year, and combine it with the Biological Sciences major:

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If you wish to advance in Biological Sciences, you will also need to include STAT 101 Statistics 1.

**200-level and beyond**

Students enrolled in the Bachelor of Science with an endorsement in Biotechnology will study a number of required courses at 200-level. These courses will establish a scientific basis for more advanced topics in biotechnology. All students majoring in Biological Sciences must take BIOL 209 Introduction to Biological Data Analysis.

www.canterbury.ac.nz/courses

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**Chemistry**

CertSc, BSc (BA minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

See also Medicinal Chemistry on page 43.

Chemistry is the central science. It deals with the composition, structure, and behaviour of the atoms and molecules that make up all forms of matter. Understanding the world at an atomic level is essential to all areas of science. Chemistry interlinks and contributes to medicine, geology, materials science, molecular physics, biology, and astronomy.

Its central role in science is emphasised by the fact that Chemistry merges with Biological Sciences (the field of biochemistry) at one extreme, and with Physics (physical chemistry and chemical physics) at the other.

Chemistry propels advances in modern society and has an important role to play in solving major global challenges such as energy sustainability, food supply, health, and the environment. Every day, we utilise products developed by experimental chemists, such as plastics, fabrics, petrol, and pharmaceuticals.

**Why study Chemistry at UC?**

- Te Kura Matū | School of Physical and Chemical Sciences at UC carries out research, teaching, and scholarship in all of the traditional areas of the discipline — inorganic, organic, physical, theoretical, environmental, and analytical chemistry. The School is also involved with the teaching of Biochemistry and provides service courses for engineers, biologists, and foresters.
- The School is equipped with excellent facilities both in undergraduate laboratories and for research work. Research activities include investigations into such diverse topics as chemical biology, synthesis, supramolecular chemistry, theoretical and computational chemistry, surface and electrochemistry, trace elements in the environment, nanotechnology, and new materials.

**Recommended background**

Year 13 chemistry is recommended preparation for first-year students, but for those who have had minimal preparation in chemistry, we offer CHEM 114 Foundations of Chemistry, an introductory Chemistry course.

Students enrolling in CHEM 111 and CHEM 112 must have at least 14 credits in NCEA Level 3 chemistry, or an equivalent background in other courses of study (eg, IB/Cambridge, or overseas qualifications). Students with less than this standard should first enrol in CHEM 114.

Students with outstanding results in NCEA Level 3 (or IB/Cambridge equivalent) and/or scholarship may be invited to enter directly into second-year courses.

**100-level courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>Chemical Principles and Processes</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>Structure and Reactivity in Chemistry and Biochemistry</td>
</tr>
<tr>
<td>CHEM 114</td>
<td>Foundations of Chemistry</td>
</tr>
</tbody>
</table>

For most Science students, core first-year Chemistry consists of two half-year courses: CHEM 111 and CHEM 112. These build on, and expand, the basic framework provided by Year 12 and Year 13 chemistry. They provide a background for advanced courses in Chemistry and for courses in Engineering, Biochemistry, Biological Sciences, Environmental Science, Geology, and Forestry Science.

To major in Chemistry and have access to the full range of second-year Chemistry courses, students must pass both CHEM 111 and CHEM 112. Those who have passed just one of these may only be able to enter some 200-level CHEM courses.

**Laboratories and workshops**

All 100-level courses involve fortnightly three-hour laboratory sessions that provide an opportunity to work with chemicals to better understand course material from lectures and to acquire some of the basic practical skills of the trained chemist. Additionally, two-hour workshops are dedicated to working through problems and questions on the course material.

**200-level and beyond**

200-level Chemistry courses develop and expand on the first-year material and give a deeper treatment of specialised areas such as organic and inorganic reactions, structural methods, and physical, environmental, and analytical chemistry.
Career opportunities

Aotearoa New Zealand’s unique mix of primary and secondary industries provides a wide choice of careers in chemistry. Expanding industries in Aotearoa, for example those related to new sources of energy and to the development of forestry and dairy resources, are further increasing the demand for qualified chemists. Aotearoa needs chemists in teaching, industry, health, and research.

- Chemists are key members of developmental teams in the pharmaceutical industry.
- Industry uses chemists in such areas as research and development of new products, monitoring product composition and quality, and environmental monitoring and regulation.
- Hospitals and other health services employ chemists in areas such as biochemical research, medical analysis, and toxicology.
- A degree in Chemistry is a good start to a teaching career with its emphasis on laboratory work and its relevance to other sciences.
- The majority of chemical research in Aotearoa is done in universities, Crown Research Institutes, and private laboratories. These institutions provide chemical challenges equal to any in the world.

Chemists are well trained in problem solving and skilled at handling information, which leads naturally into a wide diversity of job opportunities, including sales and management.

www.canterbury.ac.nz/courses

Computer Science

Certificates, CertSc, BSc, BA (minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

When people think of Computer Science they often just think of programming, but there are many more aspects to the field, including interaction design, communications and networks, software design, computer security, information systems, big data, machine learning, graphics, operating systems, educational systems, artificial intelligence, and embedded systems (processors that are embedded in everything from mobile phones to cars). All of these areas are experiencing rapid growth both in Aotearoa New Zealand and internationally, and there is a strong demand for Computer Science graduates.

Computer Science is about helping people do their work efficiently and effectively by analysing needs and constructing appropriate solutions. It goes way beyond programming, as it is about knowing how to design systems that are fast, usable, reliable, secure, scalable, and make a positive impact on society and our environment.

Computer Science students learn techniques to tackle these challenges for applications as diverse as monitoring the condition of patients in hospitals to designing educational games for smart phones.

Why study Computer Science at UC?

- UC is located in Waitaha Canterbury — the ‘Silicon Plains’ of Aotearoa New Zealand, where there are dozens of large, hi-tech companies employing UC graduates. Further afield, our graduates are in demand overseas and many come up with an idea for a product while studying, going on to become business owners and employers themselves.
- UC is acknowledged as a leader in Computer Science education in Aotearoa. It is the home of the award-winning Computer Science Unplugged project, and the internationally recognised Intelligent Computer Tutoring group. Several members of staff have awards for their work as computer science educators.
- We have a vibrant student community that encourages meeting up with like-minded students through clubs, including CompSoc and Women in Technology clubs. There is a good interface with industry, including an annual careers fair where students meet a host of employers.
As part of the Bachelor of Science, students can also choose courses from other Science subjects and non-Science subjects.

www.canterbury.ac.nz/courses

Career opportunities

There is a strong demand for graduates who are qualified in Computer Science, particularly those who combine technical skills with good communication skills and teamwork ability. Waitaha Canterbury’s leading-edge IT sector is facing a shortage of qualified graduates, meaning that UC-qualified Computer Science graduates are in high demand.

Many employment opportunities exist with organisations that run large computer-based systems, such as finance companies, airline industries, government departments, state-owned enterprises, consulting companies, and computer organisations themselves. Work with these organisations often involves international travel opportunities.

Many of our students start up their own software companies, and end up being employers rather than employees.

Apart from a professional career in computing, a degree in Computer Science can be used as a good basis for a career in the many areas in which computer systems are applied. Graduates are employed in fields including education, computer forensics, embedded systems and computer graphics, and in a variety of positions including software engineer, programmer, analyst, computer consultant, webmaster, internet developer, GIS analyst, games developer, and computing tutor.

www.canterbury.ac.nz/careers/students/subjects

Recommended background

It is possible to enrol in our courses with only a general computing background, but it is a significant advantage to have completed the NCEA achievement standards in programming and computer science (or IB/Cambridge equivalent).

A strong background in Year 13 calculus or statistics is recommended. A mathematical background is important for students who intend to advance beyond first year.

Advanced students

If you have very good results in NCEA programming and computer science (or IB/Cambridge equivalent), you can apply to join an advanced ‘overdrive’ class. Students with outstanding achievement in NCEA (or IB/Cambridge) and who have completed the Computer Science STAR programme can be considered for direct entry into second-year Computer Science courses, with a view to completing an honours degree in three years.

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COSC 101</td>
<td>Working in a Digital World</td>
</tr>
<tr>
<td>COSC 121</td>
<td>Introduction to Computer Programming</td>
</tr>
<tr>
<td>or COSC 131</td>
<td>Introduction to Programming for Engineers</td>
</tr>
<tr>
<td>COSC 122</td>
<td>Introduction to Computer Science</td>
</tr>
</tbody>
</table>

Students majoring in Computer Science are required to take COSC 121 or COSC 131, COSC 122, MATH 102, and MATH 120.

COSC 101 and STAT 101 is also strongly recommended for those who have not studied computer science previously.

It is possible to design a first year of study that enables you to either continue in your second year in Computer Science or go into Software Engineering, Information Systems, Data Science, Electrical and Electronic Engineering, or Computer Engineering. To keep your options open for this, talk with a Te Rāngai Pūkaha College of Engineering Student Advisor.

200-level and beyond

A variety of courses in Computer Science are available after the first year. These cover topics essential for building innovative systems, such as algorithms, software engineering, data communications and networking, database systems, artificial intelligence, data and network security, microprocessor systems, computer graphics, wireless security, and computer vision.

www.canterbury.ac.nz

‘It was exciting to turn my programming hobby into full-time study, and it was awesome to meet others who were into it as well in my classes. I made many friends at UC who I still keep in touch with to this day.

A strong maths foundation also helps, but I think more importantly, my abstract reasoning, troubleshooting, and building skills became quite good at UC, and they’re getting better and better.

The tech industry is great, and we always need more smart people to build cool stuff. We don’t just need programmers, we need all types to make the world great — designers, security, testers, project managers, data analysts, and more.’

Sam
Bachelor of Science in Computer Science
Bachelor of Science with Honours in Computer Science
Software Engineer, PageProof
Data Science
CertSc, BSc (major only)

Organisations are increasingly making use of large volumes of digital data, from personal medical histories, to socio-economic statistics, to internet trends. Data scientists are one of the newest professions to come from this demand for effective storage, maintenance, and use of ‘big data’. Graduates with modern, technical knowledge of computing systems and statistical methods are needed to process information in a range of industries.

Data Science combines mathematics, statistics, computing, technology innovation, and practical results. You will study at the forefront of modern practices and issues in the digital world, including ethics and security of data, strategy development, and statistical programming.

With such a wide range of industry applications and career opportunities, Data Science has been identified as one of the most essential and employable skills of the 21st century.

Why study Data Science at UC?

• Aotearoa New Zealand is ranked as the #1 country for starting a business (World Bank Group Doing Business 2020 Report), and Ōtautahi Christchurch is home to a number of computing technology and innovation industries, with many start-up companies searching for skilled graduates from UC.

• A number of research centres at UC utilise data science, including the Toi Hangarau | Geospatial Research Institute, Hangarau Tāngata, Tāngata Hangarau | HIT Lab NZ, Wireless Research Centre, Te Kāhui Roro Reo NZ Institute of Language, Brain and Behaviour, and Te Pōkāpā Anonui Ā-Mathihiko | UC Arts Digital Lab.

Recommended background

Year 13 studies in maths, statistics, or computing will give you a good background for your first-year courses, however these are not essential to major in Data Science.

100-level courses

The first-year, 100-level courses required are:

<table>
<thead>
<tr>
<th>Course code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COSC 121 or COSC 131</td>
<td>Introduction to Computer Programming for Engineers</td>
</tr>
<tr>
<td>COSC 122</td>
<td>Introduction to Computer Science</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Mathematics 1A</td>
</tr>
<tr>
<td>MATH 120</td>
<td>Discrete Mathematics</td>
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<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
</tbody>
</table>

200-level and beyond

Beyond first year, Data Science courses will further expand on data ethics, algorithms, database systems, statistical analysis and computer modelling, and data wrangling and data mining.

www.canterbury.ac.nz/courses

Career opportunities

Graduates of Data Science will find their knowledge is in high demand, as there is a global shortage of expertise to support the steady growth in data collection and digitisation.

Graduates will find employment in business and technology sectors as data scientists, data advisors, data/analytics consultants, and insight analysts.

Data Science graduates will also have a background in project implementation, research, critical analysis, problem solving, and communication skills in discussing and explaining data findings, all of which are useful skills in a number of careers.

www.canterbury.ac.nz/careers/students/subjects

Ecology

BSc (as an endorsement)

Ecology is the scientific study of the interactions between organisms and the environment. In reality, modern ecology is much broader than this, encompassing studies on individuals, species, populations, communities, and ecosystems, and includes behaviour, evolution, physiology, and increasingly molecular biology.

In Aotearoa, the study of ecology is especially important. As a small group of islands separated from larger land masses, Aotearoa New Zealand’s flora and fauna evolved unique characteristics in the absence of mammals.

The invasion of Aotearoa by humans and the organisms (including mammals) that they introduced has dramatically altered its ecology, leading to drastic reductions in numbers, or even extinctions, of the original animals and plants.

In addition, global climate change is affecting the ecology of Aotearoa, altering the distribution of both native and introduced organisms.

www.canterbury.ac.nz/courses

Career opportunities

Ecologists can take up a wide range of careers working for organisations such as the Department of Conservation | Te Papa Atawhai, city councils, Environment Canterbury | Kaunihera Taiaro ki Waitaha, universities, and Crown Research Institutes, as well as with private companies such as environmental consulting agencies.

Their work can take them to a wide range of beautiful and unique areas in Aotearoa New Zealand and beyond.

www.canterbury.ac.nz/careers/students/subjects

Recommended background

Year 13 biology and statistics or calculus is strongly recommended.

Some background in chemistry is valuable in most biological disciplines. Some knowledge of geography or earth science is also helpful.

All students should have adequate English skills.

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Cellular Biology and Biochemistry</td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Ecology, Evolution and Conservation</td>
</tr>
<tr>
<td>BIOL 113</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
</tbody>
</table>

In addition to the four required courses above, first-year courses in Chemistry, Geography, and Geology are recommended (e.g., CHEM 111 Chemical Principles and Processes, GEOG 106 Global Environmental Change, GEOG 109 Physical Geography: Earth, Ocean, Atmosphere, and GEOL 111 Planet Earth: An Introduction to Geology).

200-level and beyond

Students seeking an endorsement in Ecology need to take the core courses BIOL 270 Ecology, BIOLS271 Evolution, and BIOL 209 Introduction to Biological Data Analysis. At third year, there is a wide range of Ecology courses to choose from.

www.canterbury.ac.nz/courses

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www.canterbury.ac.nz/engineering /schools/mathematics-statistics

Te Kura Pāngarau Koiora | School of Biological Sciences

T: +64 3 369 5200
E: biological-sciences@canterbury.ac.nz
www.canterbury.ac.nz/science /schools-and-departments /biological-sciences
Economics
CertArts, CertCom, Cert Sc, BA, BCom, BSc, BSpC (minor only), BYCL (minor only)

Economics is the study of how people behave. Every day, people and society are confronted by choices. Should you go to university or start a career? What should you do with your next dollar? Should the government raise the minimum wage, or not? How do we address the big issues in the world, such as poverty and climate change?

Choices involve trade-offs where we are choosing between two things. The outcomes of choices have both costs and benefits to consider. Economics is the study of how people and societies make such decisions in the production, exchange, distribution, and consumption of goods and services.

Why study Economics at UC?
• At UC, students can specialise in Economics or study it alongside other disciplines. As an Economics major can be studied as part of an Arts, Commerce, or Science degree, you can decide which combination suits your personal strengths and interests best. Common combinations include studying Economics with Finance, Political Science and International Relations, Psychology, and Mathematics. Students who wish to combine the study of Economics with another business discipline as part of a BCom degree may be interested in the Business Economics major.
• There is a ‘compact study route’ available, which is a pathway for students looking to combine Economics with another major or another degree but who have little interest in postgraduate study in the subject. Visit the Department of Economics and Finance website for more information on this route.
• The Department of Economics and Finance operates a consultancy project and internship programme where students have the opportunity to gain real world experience that enhances the valuable work-ready skills that an Economics degree provides.
• UC is ranked in the top 250 universities in the world for Economics and Econometrics (QS World University Rankings by Subject, 2020).

Recommended background
While previous study of economics is useful preparation, it is not essential to have studied this subject at secondary school.
Students can study Economics without having to take any mathematics. However, students who wish to keep open the option of progressing to postgraduate study in Economics are strongly advised to include calculus, statistics, and modelling in their Year 13 programme.

A broad education, including history and English, is useful to develop the ability to write clearly and analyse written material.
Students with very good Year 13 results in economics may be offered direct entry to 200-level Economics courses at the discretion of the Head of Department.

200-level and beyond
Students who wish to major in Economics are required to take Intermediate Microeconomics and Intermediate Macroeconomics. Econometrics is also required for postgraduate study. Your other course choices should be determined by your interests and strengths, and there are a range of options to choose from. www.canterbury.ac.nz/courses

Career opportunities
Graduates in Economics find employment in many areas of government and business, where it is recognised that an economist’s education provides valuable specialist training for a professional career as well as good general preparation and background for an executive, entrepreneurial, or administrative career.

The increasingly large volume of information available to decision makers has created a demand for people with well-developed quantitative analysis skills, such as those developed in econometrics.

Professional economists are employed to conduct research and give advice on economic matters in various organisations such as government ministries and state-owned enterprises (eg, Kaitohutohu Kaupapa Rawa Treasury, Health, Social Development, Agriculture and Forestry, and Manatū Aorere | Foreign Affairs and Trade). Graduates also find work in marketing organisations, Te Pūtea Matua Reserve Bank, Tatarawanga Aoteaora | Stats NZ, trading and merchant banks, stockbroking, insurance, trade commissions, local authorities, market research and other consultancies, and large businesses.

Those who are passionate about economics and education can also go on to teaching careers in schools or universities.

www.canterbury.ac.nz/careers/students/subjects

Environmental Science
BSc, BA (minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

Environmental Science is an interdisciplinary approach to the study of the environment, incorporating its structure and functioning, and human interactions with the environment.

Environmental Science is an integrative subject that builds on a strong disciplinary base in subjects such as Biological Sciences, Chemistry, Geography, Geology, or Physics, with additional relevant study in areas including Antarctic Studies, Forestry Science, Water Resource Management, Mathematics, Science, Māori and Indigenous Studies, and Statistics.

Why study Environmental Science at UC?
• At UC, students combine their Environmental Science major with a second Science major, preparing them to make a difference.
• UC operates field stations at Cass (in the Waitaha Canterbury high country) and Kawatiri Westport that are particularly well equipped for Environmental Science teaching and research.
• UC is ranked in the top 200 universities in the world for Environmental Sciences (QS World University Rankings by Subject, 2020).

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 101</td>
<td>Introduction to Environmental Science</td>
</tr>
<tr>
<td>GEOG 106</td>
<td>Global Environmental Change</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Mathematics 1A</td>
</tr>
</tbody>
</table>

Plus a minimum of 30 points towards a second BSc major or as required for that subject.

To major in Environmental Science, you must also meet the requirements for a second Bachelor of Science (BSc) major, and complete the 360 points for the BSc degree. You must complete 120 points of core courses, with the additional points made up of courses from the BSc Schedule and your second BSc major.

www.canterbury.ac.nz/regulations /academic-regulations/bsc-229

200-level and beyond
ENVR 201 Environmental Science and Practice and ENVR 301 Professional Practice in Environmental Science builds on field and laboratory skills, with theoretical and practical aspects of working as an Environmental Scientist.

www.canterbury.ac.nz
Courses at 200 and 300-level cover topics around waste disposal, agriculture and environmental management, and expand further on research methods, project management, and communicating science to local communities.

Career opportunities

Environmental Science is a growth area for employment. Well-educated people with strong technical and communication skills are needed to help identify, to monitor, and to contribute to solving a variety of problems associated with the environment and with the use and allocation of resources and sustainability.

www.canterbury.ac.nz/careers/students/subjects

Te Kura Aronukurangi | School of Earth and Environment
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E: earthandenvironment@canterbury.ac.nz

/schools-and-departments
/earth-and-environment

Finance
CertCom, CertSc, BCom, BSc, BA (minor only), BSpC (minor only), BYCL (minor only)

Finance is a rapidly growing discipline that examines the acquisition and allocation of financial resources. Where financial accounting measures past performance, Finance as a discipline is forward focused. It is largely about future planning for firms or investors. Finance consists of three interrelated subject areas:

- corporate finance studies how firms raise and efficiently utilise funds obtained from lenders and shareholders
- financial markets and institutions explores how the financial system facilitates the transfer of funds from savers and lenders to borrowers
- investment analysis studies how investors choose securities and asset classes for their investment portfolios.

All of these areas assess the trade-off between risk and reward and the valuation of financial and capital assets.

Why study Finance at UC?

UC is ranked in the top 150 universities in the world for Accounting and Finance (QS World University Rankings by Subject, 2020).

The Finance programme prepares students for a variety of jobs in the financial sector and business community. Extra opportunities while studying this subject at UC include:

- internships at a variety of organisations
- participation in case competitions such as the CFA (Chartered Financial Analysts) Institute Research Challenge
- preparation for the CFA exams. The Finance major at UC is part of the CFA Certified Financial Institute University Recognition Program. This means our degree programme incorporates at least 70% of the CFA Program Candidate Body of Knowledge (CBOK). This provides students with a solid grounding in the CBOK and positions them well to sit for the CFA exams to obtain the CFA qualification. The CFA Program provides a strong foundation of advanced investment analysis and real-world portfolio management skills that will give you a career advantage
- the option to obtain the PRM (Professional Risk Manager) qualification. Risk management skills are highly sought after, particularly since the global financial crisis.

www.canterbury.ac.nz/careers/students/subjects

Recommended background

If you are intending to major in Finance, you are recommended to include maths, statistics, and modelling in your Year 13 programme. Although some previous study of accounting and economics can be useful preparation for the 100-level courses in these subjects, it is not essential to have studied them at secondary school.

Students with very good NCEA Level 3 results (or equivalent standard in another qualification framework) in mathematics, and either economics or accounting, may be offered direct entry to 200-level Finance courses at the discretion of the Head of Department.

100-level courses

If you are completing a Bachelor of Science majoring in Finance, you are required to take the following first-year courses:

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 102</td>
<td>Accounting and Financial Information</td>
</tr>
<tr>
<td>MATH 102 or MATH 199</td>
<td>Mathematics 1A (a STAR course for secondary school students)</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
<tr>
<td>ECON 104 or ECON 199</td>
<td>Introduction to Microeconomics (a STAR course for secondary school students)</td>
</tr>
</tbody>
</table>

Note: MATH 103 Mathematics 1B and FINC 101 Personal Finance are recommended.

200-level and beyond

Later courses provide a more detailed treatment of the topics introduced at 100-level.

Students majoring in Finance should also consider taking 200-level Economics courses in microeconomic theory and econometrics. Students majoring in Finance in the Bachelor of Science are required to take FINC 331 Financial Economics.

A double major (or minor) with either Accounting or Economics provides additional opportunities.

www.canterbury.ac.nz/courses

Career opportunities

Today it would be rare for a person to rise to the position of chief financial officer (CFO) without a strong grounding in both Accounting and Finance.

There are also many other career opportunities for Finance graduates, with typical jobs including financial analyst, money market and foreign exchange dealer, loan analyst, equity analyst, risk analyst/manager, portfolio manager, financial planner, investment banker, and small-business manager.

www.canterbury.ac.nz/careers/students/subjects

Financial Engineering
CertSc, BSc (major only)

Want to understand the complexity of capital markets? How to manage different types of risks? Interested in achieving a challenging technical degree with flexible career opportunities?

Financial Engineering is a cross-disciplinary field combining financial and economic theory with the mathematical and computational tools needed to design and develop financial products, portfolios, markets, and regulations. Financial engineers manage financial risk, identify market opportunities, design and value financial or actuarial products, and optimise investment strategies.

Similar to other professional degrees at UC, the first year of the Bachelor of Science in Financial Engineering provides a breadth and depth of technical skills and knowledge across the key disciplines of finance and economics, mathematics and statistics, and computer science and software engineering.
This broad foundation is then built upon over the next two years, where you will undertake further core courses across these disciplines and can choose specialisations within Financial Engineering.

Why study Financial Engineering at UC?

- This is the only programme directly targeted towards this career in Aotearoa New Zealand and echoes trends abroad in the UK, USA, and Europe. This subject was created in response to employer demand and international growth in Financial Engineering and related fields, like the wider actuarial and business analytics industries.
- The Bachelor of Science (BSc) major offers students a cross-disciplinary pathway across commerce, science, and engineering subjects, and utilises expertise from all these areas of strength at UC.
- This programme can be completed full or part-time and can be entered in either February or July of each year.

Recommended background

Previous study of mathematics (calculus and/or statistics) is recommended at Year 13 level. For those who have not studied to that level, UC offers Headstart courses in January/February for students who have not studied mathematics or statistics for some time or who lack confidence in their skills.

100-level courses

The first-year, 100-level courses required to complete a Bachelor of Science majoring in Financial Engineering are:

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COSC 121</td>
<td>Introduction to Computer Programming</td>
</tr>
<tr>
<td>or COSC 131</td>
<td>Introduction to Programming for Engineers</td>
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<td>ECON 104</td>
<td>Introduction to Microeconomics</td>
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<td>MATH 103</td>
<td>Mathematics 1B</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
</tbody>
</table>

It is also recommended to consider studying FINC 101 Personal Finance, ACCT 102 Accounting and Financial Information, INFO 125 Introduction to Programming with Databases, or MATH 120 Discrete Mathematics depending on your specialisation interests.

200-level and beyond

The broad foundation of the first year is then built upon over the next two years, where you will undertake further core courses across the disciplines and can choose specialisations within Financial Engineering.

Students who wish to major in Financial Engineering are required to take a number of core courses at 200 and 300-level. For the list of required courses, see the Regulations for the BSc at www.canterbury.ac.nz/regulations /academic-regulations/bsc-229 www.canterbury.ac.nz/courses

Career opportunities

UC Financial Engineering graduates will be ready for the international workplace in the finance industry and related fields mentioned above. They will also be well prepared for further study in this field in order to attain positions at higher technical levels.

Employers range from private industries, such as banking, investment, capital industries, security, data analysis, risk management and insurance, to the public sector (eg, Te Pūtea Matua | Reserve Bank, Kaitohotuhu Kaupapa Rawa | Treasury, or regulatory bodies).

Graduates with the cross-disciplinary knowledge and highly technical skills provided by this degree will also have openings to a breadth of career opportunities, such as investment brokers, actuaries, statisticians, and data scientists.

Past graduates of the contributing departments from related paths of study have been employed by Macquarie Capital, Deloitte, BNY-Mellon, First NZ Capital, Te Pūtea Matua | Reserve Bank, Vero Insurance, Wynyard Security Group, and many government agencies like Kaitohotuhu Kaupapa Rawa | Treasury, Taturanga Aotearoa | Stats NZ, and Hīkina Whakatutuki | Ministry of Business, Innovation and Employment.

www.canterbury.ac.nz/careers/students/subjects

‘The wide range of courses in the Financial Engineering degree was the biggest draw. I knew I wanted to study some form of mathematics/statistics at university, and Financial Engineering allowed me to tie in some Computer Science, Finance, and Economics. Employers in the financial sector are usually looking for strong quantitative skills. Taking a double major with Financial Engineering and Statistics (or Mathematics) is pretty ideal.

We used techniques learned in econometrics and data mining to help World Vision plan and allocate their time in schools more effectively. Using tools from class in the real world allowed us to truly understand how our theoretical knowledge is actually applied to real problems.’

Nicholas
Bachelor of Science in Financial Engineering and Statistics
Bachelor of Science with Honours in Computational and Applied Mathematical Sciences
Forestry Science
BForSc

The Bachelor of Forestry Science (BForSc) is a professional degree offered by Te Kura Ngahere | School of Forestry. It is an interdisciplinary degree that prepares our graduates for managing forest resources by combining the study of core science courses with management, commerce, and technologies.

Forestry Science graduates are highly sought after by employers and follow exciting and rewarding career paths. As a graduate, you can choose a career in commercial forestry, conservation and restoration ecology, research, or policy and planning in Aotearoa New Zealand or overseas.

If you care about the management of natural resources and are interested in being part of a huge worldwide industry, of particular national relevance to Aotearoa, then forestry could be for you.

Why study Forestry Science at UC?
- UC is the only Aotearoa New Zealand university to offer a professional degree in Forestry.
- UC is located near plantations and native forests, which are used for both teaching and research, and students are able to visit other forestry organisations throughout the country.
- The School has exchange programmes with the University of British Columbia in Canada, and Virginia Polytechnic Institute and State University in the USA, which allow students to complete one or two semesters of their BForSc studies at those universities while paying UC fees.
- The BForSc equips you with a broad understanding of natural resource management issues. During the course of your studies you can specialise in a range of areas including forest engineering, wood science, forest management, forest science, forest marketing and finance, commerce, and conservation management.
- Small class sizes make the BForSc a friendly and social programme, and the Forestry Students’ Society (FORSOC) organises social functions throughout the year.
- UC Forestry students may be eligible for forestry industry scholarships. For more information, contact Te Kura Ngahere | School of Forestry.
- You may also enrol for both Forestry and Commerce, or Forestry and Science degrees, at the same time (double degree), or complete a Commerce degree with a strong Forestry emphasis.

Research and fieldwork
Te Kura Ngahere | School of Forestry has excellent teaching and research facilities, and opportunities to work in the field are maximised. UC’s field stations located near Arthur’s Pass and at Kaitawiti Westport are used for forestry teaching and research.

Staff are actively engaged in research on forest management, conservation and restoration ecology, biology, silviculture, biosecurity, geospatial applications, tree and forest modelling, tree breeding, economics, harvesting and transport, timber processing, and marketing.

Te Kura Ngahere | School of Forestry is part of Te Rāngai Pūtaiao | College of Engineering, and has strong links with Te Rāngai Umanga me te Ture | College of Business and Law, and Te Rāngai Pūtaiao | College of Science, which ensures that students receive a broad education and graduate with a wide range of career options.

Recommended background
The Bachelor of Forestry Science is open to all students who gain entry to the University. It is recommended that prospective students take NCEA Level 3 biology and maths, including statistics and probability — or the IB/Cambridge equivalent.

You may be able to fast-track your degree and gain direct entry to the second year, if you have excellent Year 13 results or a New Zealand Certificate in Science with outstanding merit. It is possible to gain exemption for parts of the Forestry examinations with a Bachelor of Science (BSc) or a New Zealand Diploma in Forestry with outstanding merit.

If you have not studied Year 13 statistics, or if you feel you have a weak background in this subject, you should consider enrolling in a UC Headstart preparatory course over summer.

100-level courses
The following are the compulsory courses for the first year of the Forestry Science degree:

<table>
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<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>FORE 111</td>
<td>Trees, Forests and the Environment</td>
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<tr>
<td>FORE 131</td>
<td>Trees in the Landscape</td>
</tr>
<tr>
<td>FORE 141</td>
<td>Forest Growth and Measurements</td>
</tr>
<tr>
<td>FORE 151</td>
<td>Commercial Aspects of Forestry</td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Ecology, Evolution and Conservation</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
</tbody>
</table>

Students must also take another 30 points of 100-level courses from any degree at UC in their first year.

The first year is best taken at UC, although it may be taken at any Aotearoa university. Students considering studying the first year of the Bachelor of Forestry Science at another Aotearoa university should consult Te Kura Ngahere | School of Forestry for their course selection, which would include the distance courses FORE 102 Forests and Societies or FORE 105 Forests of the World.

200-level and beyond
In the second year, the main focus is on forestry courses with some supporting Science subjects. In the third year, more applied Forestry courses are introduced. One further subject is taken from an option schedule available to both third and fourth-year students.

In the fourth year, students are required to take three compulsory courses and three further courses from the option schedule, which can include a course from another UC degree.

Students who attain a good grade point average during the second and third years will be invited to consider undertaking honours in the final year of the degree. Those who choose to do so must complete a dissertation, which is a piece of original research on a Forestry topic usually chosen by the student.

www.canterbury.ac.nz/courses

Career opportunities
The degree is very well supported by employers in Aotearoa New Zealand. Students are able to make employer contacts through New Zealand Institute of Forestry meetings and lectures on campus. These contacts can also provide summer work opportunities.

Some of the biggest companies in Aotearoa hire UC graduates and many students obtain work overseas. Of those choosing to enter the workforce, the majority of our graduates are employed by the time they finish their degree.

Possible careers include forest management or consultancy (plantation and native forests), conservation, harvesting, wood processing, planning, policy, forest science, timber appraisal, biosecurity, forest economics, sustainability, and land management.

www.canterbury.ac.nz/careers/students/subjects

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www.canterbury.ac.nz/engineering
/schools/forestry
‘I love the balance between theoretical and hands-on work. Forestry science combines science with management, commerce, and technology, which are all aspects that really interest me.

What really appealed to me was a nice balance between working inside and in the field — completing work in the office, and then also going to forest operations to manage and work.

The small class sizes also make Forestry very appealing. All of the students and lecturers know everyone personally, which is really nice. FORSOC is also a great club where you can meet new people studying Forestry Science and is definitely worth joining.’

Boris
Bachelor of Forestry Science

Geography
CertArts, CertSc, BA, BSc, BCom (minor only), BSpC (minor only), BYCL (minor only)

Geography is an exciting and distinctive discipline at the interface between Science and Arts. Its focus is on putting various types of knowledge together to find innovative solutions to problems faced by society such as climate change, poverty, sustainability, health, and inequality. We aim to provide courses and learning that will enable you to make a difference in your chosen career path after university.

Studying Geography will allow you to take an informed and analytical view of our changing world, and of your place in it. The relationship between people and their environment is a key geographical theme, as is the way in which this relationship can be made more sustainable for the future.

This puts Geography at the core of many important current debates. For example, geographers are able to examine the issue of climate change holistically by looking at both the physical factors that affect the problem and also the human responses to the challenges created.

Why study Geography at UC?

- UC is ranked in the top 150 universities in the world for Geography (QS World University Rankings by Subject, 2020).
- The undergraduate programme is structured around four curriculum pathways: physical geography, human geography, geographic information systems (GIS), and resource and environmental management.
- Learning through community engagement occurs in a number of courses within Geography. It is a key feature of GEOG 110 Human Geography: People, Process, Place; and of GEOG 309 Research for Resilient Environments and Communities, which involves students working with local communities to address important real-world issues.

Resources and fieldwork
Te Kura Aronukurangi | School of Earth and Environment is committed to close contact between students and our staff. 100-level students have their own laboratory, and the School’s learning centre and computer labs are available to students for quiet study, group work, and research.

Fieldwork in various places is an integral part of many courses. The Department operates climate stations in Kā Tiritiri-o-te-moana Southern Alps and elsewhere in Te Waipounamu South Island, and utilises the University’s field stations at Cass and Kawatiri Westport.

The School hosts Te Tai Whenua o te Hauora GeoHealth Laboratory, University Centre for Atmospheric Research, and also Gateway Antarctica, with staff and graduate students often making summer visits to Scott Base in Antarctica.

Recommended background

Entry into Geography is open to all students who are eligible to enter an Aotearoa New Zealand university. The essential background is a lively and enquiring interest in change in today’s world.

Some experience of geography in Year 12 and Year 13 will help, but is not strictly necessary. Depending on how students wish to develop their geographical interests, a background in science or experience of humanities or social science subjects (eg, languages, history, digital technologies) can be useful.

100-level courses

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<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>GEOG 106</td>
<td>Global Environmental Change</td>
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<tr>
<td>GEOG 110</td>
<td>People, Places and Environments</td>
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</tbody>
</table>

The two courses are interrelated, with GEOG 106 based on an integrated approach to understanding the interaction of physical and human processes, and GEOG 110 focused more on natural and human environments.

Each course has three hours of lectures a week. There are also regular two-hour lab classes for exploring the issues raised in lectures in more detail. These labs are an opportunity to get to know your classmates better, as much of the work is group-based, as well as to gain some experience of practical investigation in Geography.

200-level and beyond

There is a range of courses at 200 and 300-level. You can specialise within or combine courses from the four curriculum pathways (as many students do):

- physical geography
- human geography
- geographic information systems (GIS)
- resource and environmental management.

There are also options to undertake internships and research as part of your degree. GEOG 309 Research Methods in Geography is designed to reinforce study in all of these pathways.

www.canterbury.ac.nz/courses
Career opportunities

Recent graduates have found work all over Aotearoa New Zealand and the world, from Tāmaki-makaurau Auckland to Melbourne, California to Antarctica. Many have found careers in the public service, the tourism industry, private companies dealing with geographic information systems (GIS) and global positioning systems (GPS), the police, local authorities, and in education.

The Resource Management Act has created a lively market for geographers in consultancy and in regional and local government. Those who gain technical expertise in areas such as GIS and remote sensing are also in demand from both the public and private sectors. In addition, research and policy positions in central, regional, and local government are popular.

Some graduates find work overseas for Manatū Aorere | Ministry of Foreign Affairs and Trade, development agencies, and the United Nations, or in positions that are particularly people-focused, like the union movement, teaching, or personnel, where communication skills are critical.

www.canterbury.ac.nz/careers/students/subjects

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‘I wanted to study people and their interaction with the environment. I believe it is important to have a good understanding of the environment so you can educate the community to help them understand the environmental changes around them.

I love the feeling of being a part of something big! But at the same time never feeling small! The lecturers and staff at the University are incredibly approachable making you always feel welcome. All around I constantly feel supported to do my best and achieve as much as I can, not just by my peers but also by my lecturers and tutors.’

Ashley
Ngāi Tahu
Bachelor of Science in Environmental Science and Geography
Studying towards a Master of Urban Resilience and Renewal

Geology

CertSc, BSc, BA (minor only), BCom (minor only), BSpC (minor only), BVCL (minor only)

Aotearoa New Zealand, on the active margin of the Pacific with its volcanoes, earthquakes, dramatic geomorphology, and 500 million years of geological history, is one of the best places on Earth to study geological processes. Our position in mid-southern latitudes and relative proximity to Antarctica means that Aotearoa New Zealand is a key location for climate change research.

Geologists are directly involved in the monitoring, prediction, and assessment of hazards such as volcanoes, earthquakes, landslides, and tsunamis. The geologist has an important role in land planning processes and in assessing environmental impact.

Geologists have developed one of the most exciting scientific theories of the 20th century — plate tectonics — which explains the origin and locations of all the major geological features and Earth building processes of the planet. Geologists also search for the natural resources that sustain our technological society, not least of all, water. The construction of buildings, bridges, roads, dams, and reservoirs requires geological expertise.

Why study Geology at UC?

• Te Kura Aronukurangi | School of Earth and Environment at UC is one of the top geoscience research departments in the country and, not surprisingly, we are leading the world in our studies of earthquakes.
  First-year students have their own laboratory for practical classes and teaching staff are readily contactable.

• Field sciences are a distinctive feature of the subjects offered at UC and are supported through a range of field facilities at Cass and Kaitihi Westport. Field studies are carried out in the locations and environments around these field stations.

• UC is ranked in the top 150 universities in the world for Earth and Marine Sciences (QS World University Rankings by Subject, 2020).

Recommended background

Entry into first-year Geology courses is open to all students who are eligible to enter an Aotearoa New Zealand university.

There are no specific requirements for starting first-year studies in Geology and while some knowledge of basic science is preferable, it is not essential. All you need is enthusiasm and an interest in the world around you.
100-level courses

You can take one, two, or all three of the 100-level courses on offer, depending on preference. However, it is normally necessary to take and pass two in order to gain entry into 200-level Geology courses. To major in this subject, students need to take GEOL 111 and one of the other two courses.

These courses involve lectures and one practical class per week plus one day in the field.

GEOL 113 is an optional first-year course that will be of interest to Science and non-Science students alike.

Students should also note that 60 points from the following subjects at 100-level are required for entry into honours in Geology: Astronomy, Biological Sciences, Chemistry, Computer Science, Geography, Mathematics, Physics, or Statistics.

<table>
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<tr>
<th>Course code</th>
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<tbody>
<tr>
<td>GEOL 111</td>
<td>Planet Earth: An Introduction to Geology</td>
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<tr>
<td>GEOL 113</td>
<td>Environmental Geohazards</td>
</tr>
<tr>
<td>GEOL 115</td>
<td>The Dynamic Earth System</td>
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</table>

200-level and beyond

The six core 200-level Geology courses develop and expand on much of the first-year material. Important geological principles and techniques are taught here, such as the interpretation of sediments, volcanic processes, how rocks deform in the Earth’s crust, how ancient geological events are dated, and the identification of minerals and rocks using the microscope.

GEOL 240 Field Studies A — Mapping and GEOL 241 Field Studies B — Field Techniques are field studies courses in which students learn the techniques of geological observation, data collection, and field mapping. Excursions are run to several different locations, including to Kawatiri Westport on Te Tai Poutini West Coast of Te Wai Puranumu South Island where there is a modern, well-equipped field station.

The 300-level courses cover a wide range of topics for the student majoring in Geology.

www.canterbury.ac.nz/courses

Career opportunities

A career in Geology offers a very wide spectrum of work environments and employment opportunities.

Geology graduates find positions as research scientists, policy analysts, exploration geophysicists, mining and exploration geologists, practitioner engineering geologist with consultancies, natural hazard analysts and consultants, coal and petroleum geologists, teachers, GIS specialists, environmental impact officers and consultants, hydro-geologists, seismic interpreters, resource advisors, research technicians, soil technicians and research assistants, museum curators, and more.

They are employed in the mining and petroleum industries, national and local government, planning and conservation organisations, university teaching and research, secondary teaching, museums and science centres, energy companies, consulting and engineering firms, research institutes, and exploration firms.

www.canterbury.ac.nz/careers/students/subjects

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‘Studying Geology has brought me to many places outside of campus. I am able to apply theories and processes to visualise what the environment was like in the past.

I have been interested with the processes and mechanisms involved leading up to an earthquake event. I hope to work in the geotech consulting industry, and be able to apply the practical experiences I have learnt from studies.’

Charles
Bachelor of Science in Geology
Studying towards a Professional Master of Engineering Geology

Health Sciences

BHSc, BA (not a major or a minor subject), BSc (not a major subject)

Health Sciences students are passionate about getting involved in their communities and improving the health of the population. We promote opportunities for volunteering and gaining a well-rounded education.

Health Sciences at UC provides students with a non-clinical degree and a multidisciplinary introduction to a range of important health issues from genetics, to the health of populations, evidence-based decision making, psychology, education, and public policy.

Many Health Sciences courses may be taken as part of the Bachelor of Health Sciences (BHSc), or included in a Bachelor of Arts or Bachelor of Science.

Why study Health Sciences at UC?

• There are many different paths that you can explore at UC, and the good thing about the BHSc is that it has a wide variety of courses, allowing you to keep your options open and learn about lots of different areas before embarking on your career.
• Some of the majors in the BHSc will offer the opportunity for practical placement and skills development in health-related workplaces.
• Te Kura Mātai Hauora | School of Health Sciences is well-equipped for conducting a wide range of research and projects.
• Thanks to involved academic staff, most of the lecturers know who you are, what your interests are, and will look at ways to help you to achieve your goals.
• Students who complete the Public Health major for the BHSc will be able to meet the generic public health competencies and the health promotion competencies for Aotearoa.
• UC is ranked first in Aotearoa New Zealand for research in Public Health (Te Amorangi Mātauranga Matua | Tertiary Education Commission 2018 PBRF assessment).

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>BIOL 116</td>
<td>Human Biology</td>
</tr>
<tr>
<td>HLTH 101</td>
<td>Introduction to Health Studies</td>
</tr>
<tr>
<td>HLTH 106</td>
<td>Ngā Take, Te Wero: Māori Health Issues and Opportunities</td>
</tr>
<tr>
<td>HLTH 110</td>
<td>Epidemiology</td>
</tr>
</tbody>
</table>

www.canterbury.ac.nz 39
As well as the core courses HLTH 101, HLTH 106, HLTH 110, and BIOL 116, students select a BHSc major from the list below:

**Majors**

- Environmental Health
- Health Education
- Māori and Indigenous Health
- Psychology
- Public Health
- Society and Policy

Several BHSc majors start with compulsory courses from other subject areas at the 100-level eg, Psychology. Double majors are possible for some majors. Individual HLTH courses may also be taken for inclusion in a BA or a BSc.

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

### 200-level and beyond

Students can continue to study health-related courses at 200, 300, and postgraduate-level. Whether it is looking at technological interventions, health education, sociology behind health and illness, the pros and cons of Aotearoa New Zealand’s health system, how to build resilience, or public and policy issues, there is broad scope to find an area of health that interests you.

Students who are not enrolled in the BHSc and wish to continue examining national and international health issues can consult the Programme Coordinator for advice on which courses they can include in their degree.

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

### Career opportunities

The health workforce includes a wide variety of clinical roles defined by legislation. There are also many non-clinical roles that make up about one third of the total health workforce.

The undergraduate Health Sciences courses will provide an essential foundation for those seeking non-clinical health sector roles. Depending on the major(s) taken, an interdisciplinary non-clinical Health Sciences background has high prospects of employment in such areas as health promotion, environmental health, health psychology, community health, Māori and iwi health, behaviour change, health policy, administration, health education, health technology assessment, and health research.

These courses will also help experienced health professionals to extend their knowledge and skills, and to prepare for new career opportunities.

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

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### Environmental Health

**BHSc**

The Environmental Health major provides grounding in the fundamental sciences that underpin an understanding of the environmental risk factors that affect health and wellbeing and the methods used to assess them. This encompasses:

- the geographical distribution of disease exposure to key risk factors and methods used to minimise exposure
- the context of government legislation aimed at creating and maintaining healthy environments.

### Career opportunities

Graduates of the Bachelor of Health Sciences majoring in Environmental Health will potentially find employment as environmental health officers (requires additional qualification), laboratory roles in health laboratories, in local and national environmental health roles, or progress to postgraduate research in environmental health science.

### Health Education

**BHSc**

This major prepares graduates with the knowledge, skills, and confidence to work with individuals and groups to enhance wellbeing. They develop specific health education and pedagogical knowledge to apply in a diverse range of settings. Experiential learning in a variety of contexts (eg, mental health, sexuality, and nutrition) allows students to recognise factors that influence health and develop a range of strategies to address them.

Students engage in debate and critical reflection on a range of contemporary health issues. Through this engagement, students develop an understanding of ethical issues and principles, a respect for the autonomy and choice of both individuals and groups, and competency in collaborative and consultative ways of working.

### Career opportunities

Career options for students who major in Health Education include employment in health-related institutions and agencies such as Community and Public Health (in Nutrition, Sexuality, Health Promoting Schools, and Mental Health teams), Drug and Alcohol agencies, Family Planning, the Mental Health Foundation, Nutrition Advisories, Red Cross, and teaching Health Education in secondary schools to a senior NCEA level (teaching qualification required).

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### Māori and Indigenous Health

**BHSc**

E ngā mana, e ngā reo, nāia te reo pōwhiri ki a koutou. Tēnā koutou katoa.

The purpose of the Māori and Indigenous Health major is to prepare culturally competent graduates who are able to use, apply, and integrate Māori, bicultural, and indigenous knowledge and practices in their chosen health and social services related careers.

The holistic Māori view of health and wellbeing is an important component of the major that includes knowledge and skills in the following areas:

- Te Ao Tangata — Engaging with Māori: understanding, respect, te reo, interpersonal and cross-cultural communication/dialogue, and Māori health-based experiences
- Te Ao Hauora — Working with health professionals: promoting student’s understanding of the multiple disciplines and roles involved in delivering health care to Māori, including clinicians (eg, pharmacists, doctors, physiotherapists, and psychologists), the cultural/community/clinical interface, and interprofessional/interdisciplinary collaboration
- Ngā Ratonga Hauora — Working with health services and health systems: providing students with a thorough grounding in sociohistorical health developments and current health system structures, including Māori and iwi community-based health and social services.

### Career opportunities

Career options for students who major in Māori and Indigenous Health include research and policy analysis or advice, health promotion, and community health liaison roles in non-governmental organisations focused on health and wellbeing, Māori and iwi health and development organisations, District Health Boards, and local government.

Students interested in progressing to postgraduate study will be well prepared as a result of this major, particularly in relation to Māori and Indigenous Studies, and/or Health.

### Psychology

**BHSc**

See page 46.
Public Health
BHSc

The purpose of the major in Public Health is to produce graduates with knowledge and skills in science and health, experience in critical appraisal and scientific investigation, and an understanding of values and ethics in health. Graduates will have the ability to apply these to improving health and wellbeing through disease prevention, health promotion, and health service planning, delivery, and evaluation.

The major in Public Health aims to:

• provide students with a strong foundation in health sciences, with detailed knowledge in public health;
• equip students to meet the Aotearoa New Zealand generic competencies for public health. This is endorsed by the Health Promotion forum to provide foundation knowledge and understanding of Ngā Kalakatanga Hauora mo Aotearoa | Health Promotion Competencies for Aotearoa New Zealand;
• provide students with the knowledge and skills to operate effectively in health sector organisations (such as district health boards, primary care organisations, public health units, Māori health organisations, and non-governmental organisations);
• contribute to the health sector workforce by preparing students to work as effective members of multidisciplinary teams in the health sector;
• contribute to meeting national health workforce development goals;
• provide the required foundation for students who wish to undertake postgraduate study in health-related fields.

Career opportunities

Students with a Bachelor of Health Sciences in Public Health will be able to work effectively as members of multidisciplinary teams in the health sector. Examples of career pathways include community development roles in public health units, district health boards, non-governmental organisations, local government, health promoters, public health analysts, and a research career in public health.

Graduates might also go on to postgraduate study to further their specialisation in the field.

Society and Policy
BHSc

The Society and Policy major focuses on the relationships between health science, health governance, bioethics, and society. It comprises an interdisciplinary core based on sociology of health, policy issues in health technology, and health delivery at the local, national, and global levels, together with research training in qualitative and quantitative social science research methods.

Graduates of the Society and Policy major will acquire core knowledge and skills relevant to health employment and sector-defined competencies. This includes some of the Aotearoa New Zealand generic public health competencies (PHANZ 2007), and some of the Aotearoa health promotion competencies (Health Promotion Forum 2012), including bioethics competencies that are specific to this major.

They will also have in-depth knowledge in an area of specialisation relating to health policy, health geography, bioethics, and social issues relating to health.

Career opportunities

This major prepares students for positions in policy analysis, social science research, and the development of public policy. It also prepares them for further research in humanities and the social sciences. Students who graduate from this programme may go on to postgraduate study in Health Sciences.

If students take the Sociology option at 300-level, they may also go on to postgraduate work in Sociology.

Those who don’t wish to complete a postgraduate degree may look for jobs in health administration, health policy, and other non-clinical roles within the broad health sector. This major also provides a foundation for graduate clinical degrees.

Examples of career pathways include:
• careers in health-related institutions and agencies
• community development roles in public health units, district health boards, Māori and iwi health/development organisations, NGOs, and local government agencies
• health policy analysts
• postgraduate studies towards a research career in health
• social and health researchers.

Linguistics
CertArts, CertSc, BA, BSc, BCom (minor only), BSpec (minor only), BYLC (minor only)

Linguistics is the scientific study of language. It addresses questions relating to the structure of language, how and why languages differ and change, how humans acquire and process language, the relationship between language and society, and the systems of speech sounds that underlie the words and utterances that we speak and hear.

For example, studying linguistics can help us to understand how children can easily learn to speak both English and te reo Māori, why Aotearoa New Zealanders sound different from Australians, why the words ‘air’ and ‘ear’ rhyme for some people but not for others, and why ‘sweet as’ isn’t just ‘sling’.

Given the unique nature of language, Linguistics is inherently interdisciplinary and bridges the sciences, the social sciences, and the humanities. It has links with Anthropology, cognitive science, Computer Science, Education, Engineering, evolutionary biology, language study, neurology, Philosophy, Psychology, and Sociology, among other fields. It is therefore an ideal complementary field of study.

Why study Linguistics at UC?

• UC is ranked in the top 100 universities in the world for Linguistics (QS World University Rankings by Subject, 2020).
• Many disciplines are represented at UC’s Te Kāhui Roro Reo | New Zealand Institute of Language, Brain and Behaviour, where researchers study the foundations of language as an integrated, multimodal, statistical system operating in a social, physical, and physiological context.

Recommended background

Linguistics is not taught in schools, so no specific school background is needed in order to begin it at university. The main requirements are curiosity and a desire to improve one’s ability to think and express oneself clearly. Some knowledge of a language or languages other than English is desirable but not essential.

100-level courses

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<tr>
<th>Course code</th>
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<tbody>
<tr>
<td>LING 101</td>
<td>The English Language</td>
</tr>
<tr>
<td>ENLA 101*</td>
<td>Language and Society in New Zealand and Beyond</td>
</tr>
<tr>
<td>LING 102</td>
<td>Basics of Language for Language Learners</td>
</tr>
<tr>
<td>ENLA 102*</td>
<td>European Languages in Europe and Beyond</td>
</tr>
</tbody>
</table>

*Students intending to double major in Linguistics and English Language must substitute LING 103 for LING 101, and LING 104 for LING 102.
You must take the following courses in first year if you intend to major in Linguistics:

- LING 101
- LING 102 or LING 103.

LING 101 and LING 102 are also prerequisites for 200-level Linguistics courses.

**Language course/s**

Linguistics majors need to include one course in a language other than English (or have equivalent language ability). This can be taken any year during the degree. UC students can choose from: Chinese, French, German, Japanese, Russian, Spanish, and Te Reo Māori courses.

**200-level and beyond**

At 200 and 300-level, more specialised courses explore a variety of topics including forensic linguistics, sociolinguistics, syntax, phonetics and phonology, morphology, Aotearoa New Zealand English, and the history of English.

LING 215 The Sounds of Speech, LING 216 Systems of Words and Sounds in Language, and LING 217 Sentence Structure are the core courses required for anyone to major in Linguistics.

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

**Career opportunities**

Linguistics provides the foundation for a wide range of jobs and careers including teaching, education, translation/interpreting, marketing, publishing, journalism, law, medicine, information technology, speech and language therapy, social research, and international relations. In fact, studying Linguistics will help prepare you for any profession that requires skills in analytical thinking, problem solving, argumentation, critical thinking, data collection and analysis, and written and oral expression.

Naturally, you will also become familiar with many different languages and cultures, and as a result, develop important cross-cultural skills.

Linguistics is often a training ground for those who chose teaching English as a second language, which is a popular career and offers excellent travel opportunities.

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

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Mathematics

CertArts, CertSc, BA, BSc, BCom (minor only), BSpC (minor only), BYCL (minor only)

Our modern society is underpinned by many mathematical results and insights. Mathematics is a living subject with new ideas, techniques, and theorems constantly being created, tested, and explored.

Mathematicians are at the forefront of breakthroughs in science, technology, and finance. Did you know:

- Money is kept secure when using internet banking protocols based on mathematical cryptography and prime numbers.
- Medical images such as MRI are reconstructed using mathematical tools that were first developed in the early 1800s.
- The mathematics of wavelet transformations helps us to understand seismic activity, which may one day assist us with the prediction of earthquakes.
- Mathematicians can find solutions to equations that govern the universe to help us understand physical phenomena, without the need for expensive experiments.
- Mathematical modelling can help with the protection of our native flora and fauna.

Mathematical thought is one of the greatest human achievements, and has been around for over 4,000 years. In all these millennia, mathematicians have been one step ahead and are already preparing for the technological advances of the coming generation.

Why study Mathematics at UC?

- UC is known internationally for its involvement in Mathematics and Statistics education and research. Several members of staff have awards for their work in this area. Our research expertise underpins our undergraduate teaching.
- Every year, Te Kura Pāngarau | School of Mathematics and Statistics welcomes visiting scholars on the Erskine Fellowship Programme. Students benefit greatly from their teaching and the alternative perspectives they offer.
- The School is active in supporting and promoting undergraduate research through summer projects and honours dissertations, with some of our recent budding scholars heading to Oxford, Harvard, and Yale for postgraduate work.
- UC also has a thriving culture that encourages meeting up with like-minded students through clubs.

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‘I have fun learning the ways in which numbers can represent the real world. I really want to become a secondary school teacher in the future. To become a teacher, you need to be able to teach subjects that you enjoy, so that’s why I chose Mathematics and Economics as my majors.

I feel like people in UC respect me and my culture. As a member of the Student Volunteer Army’s executive, I can feel that UCSA always tries to improve the experiences for international students. They are some of the most talented and passionate people I have ever met.’

Quynh (Trudy)

Studying towards a Bachelor of Science in Mathematics and Economics
Recommended background

Entry into MATH 101 is open to all students with entry to the University. Entry into MATH 102 requires 14 credits at NCEA level 3 maths. Te Kura Pāngarau | School of Mathematics and Statistics offers a choice of courses designed to cater for students with a range of backgrounds and interests. Detailed entry recommendations are available at www.canterbury.ac.nz/engineering/schools/mathematics-statistics

Students who have performed very well in NCEA Level 3 statistics and/or calculus (or IB/Cambridge equivalent) may be eligible for direct entry into a 200-level Mathematics course. UC also offers Headstart summer preparatory courses in January/February for students who have not studied mathematics or statistics for some time, or who lack confidence in their skills. www.canterbury.ac.nz/get-started/transition/headstart

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>MATH 101</td>
<td>Methods of Mathematics</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Mathematics 1A</td>
</tr>
<tr>
<td>MATH 103</td>
<td>Mathematics 1B</td>
</tr>
<tr>
<td>MATH 120</td>
<td>Discrete Mathematics</td>
</tr>
</tbody>
</table>

The core of the 100-level programme consists of linear algebra and calculus, found in MATH 102* and MATH 103. MATH 102 is a prerequisite for MATH 103. Together, these courses will allow you into almost any 200-level Mathematics course and are necessary for those wishing to major in Mathematics.

MATH 102 is also required or recommended for people intending to major in any of several subjects, including Economics, Statistics, Data Science, Financial Engineering, and Physics. Anyone planning to study Engineering will require the Engineering Mathematics courses EMTH 118 and EMTH 119.

MATH 120 is an introductory course in discrete mathematics, a subject that underpins many areas of modern-day science including cryptography, coding theory, and computational biology. MATH 120 is required for people intending to major in Data Science and Computer Science.

* Students who have not passed a substantial amount of Year 13 mathematics, or its equivalent, are strongly advised to enrol in MATH 101 before advancing to MATH 102.

200-level and beyond

UC offers a wide variety of courses at 200 and 300-level. These include courses in discrete mathematics, linear algebra, calculus, differential equations, mathematical modelling, and statistics.

If you are majoring in Mathematics, you need 45 points from selected MATH 200-level courses and at least 60 points from MATH 302–394.

If you are unsure which courses best suit your needs, contact a Student Advisor.

It is good to include other subjects at 200-level. Popular choices include Chemistry, Computer Science, Economics, Management, Physics, and Statistics. www.canterbury.ac.nz/courses

Career opportunities

Perhaps the most important quality that a Mathematics graduate develops is the ability to reason logically and in depth. Mathematics is a creative, collaborative pursuit. The habits of thought developed by studying Mathematics are of permanent value.

Mathematics graduates are highly employable, working in computing, finance, commerce, insurance, scientific institutions (such as Crown Research Institutes), law, teaching, and many other fields.

Employment opportunities are particularly good for people who combine qualifications in Mathematics with qualifications in other disciplines such as the Physical Sciences, Statistics, Computer Science, Engineering, Management, and Economics. www.canterbury.ac.nz/careers/students/subjects

Te Kura Pāngarau | School of Mathematics and Statistics
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E: enquiries@math.canterbury.ac.nz
www.canterbury.ac.nz/engineering/schools/mathematics-statistics

Medicinal Chemistry

CertSc, BSc (major only)
See also Chemistry on page 29.

Medicinal Chemistry explores the design and creation of new medicinal drugs for the treatment and prevention of illnesses.

This major will take students through the entire lifecycle of creating medicines, from discovering and isolating medicinal agents within natural and synthetic sources, through to clinical trials, ethical and regulatory approvals, and sustainable production and sales.

UC’s programme also includes introductory courses in business and commercial opportunities, such as intellectual properties and patents of new medicines.

The pharmaceutical industry is growing globally, and there is a high demand for more medicinal chemists to create life-changing medicines.

Why study Medicinal Chemistry at UC?

• Te Kura Matū | School of Physical and Chemical Sciences is equipped with excellent facilities, both in undergraduate laboratories and for research work.

• Students in the later years of the major will be able to get involved in the School’s research endeavours, with current research interests focused on the discovery of bioactive molecules for therapies and therapeutic agents.

• UC’s programme has a unique focus on the bioactivity of Aotearoa New Zealand and Polynesian flora and fauna, traditional rongoā Māori medicines, and healthcare issues specific to our bicultural community.

• Final year courses give an introduction to the drug production and business marketing process, preparing students for work in the pharmaceutical industry or even patenting their own products.

Recommended background

Year 13 chemistry study is recommended preparation for first-year students, but for those who have had minimal preparation in chemistry, we offer CHEM 114 Foundations of Chemistry, an introductory Chemistry course.

Students with outstanding results in NCEA Level 3 (or IB/Cambridge equivalent) may be invited to enter directly into second-year Chemistry courses.

Career opportunities

Medicinal Chemistry students will have practical experience in synthetic and organic chemistry, pharmaceutics, and microbiology, as well as non-laboratory skills in project management, scientific communication, commercial marketing, and collaboration with a variety of other scientific and business fields.

They will find a variety of rewarding roles within the global pharmaceutical industry, as well as in hospital clinics, private laboratories, biomedical companies, Crown Research Institutes, universities, and among many therapeutic and healthcare services. Graduates may also be interested in reviewing global compliance guidelines and new drug applications, with regulatory bodies such as the US Food and Drug Administration (FDA).

The major will also prepare graduates for further postgraduate research studies in modern medicine and healthcare.

www.canterbury.ac.nz/courses

Te Kura Matū | School of Physical and Chemical Sciences
T: +64 3 369 3100
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www.canterbury.ac.nz/science/schools-and-departments/phys-chem/medicinal-chemistry

www.canterbury.ac.nz 43
Philosophy
CertArts, CertSc, BA, BSc, BCom (minor only), BSpC (minor only), BYCL (minor only)

Are killer drones immoral? What about genetic engineering? Should rich countries give substantially more in overseas aid? Are there objective moral truths? Does God exist? Could we survive death as computer uploads? What is consciousness? Can machines think? What is the difference between science and myth? Why do we enjoy art? Is time travel possible? These are a few of the questions that are studied in UC Philosophy classes.

Philosophy teaches you how to think about such questions rationally, carefully, and clearly. These skills are of real value in the workplace, and also when dealing with more theoretical aspects of other disciplines, including professional subjects such as Law, Nursing, and even Engineering.

Why study Philosophy at UC?
• UC offers world-class expertise in specific areas of Philosophy and a broad-based degree. The Department is a tight-knit group who go the extra mile to help students.
• The Philosophy degree is flexible, allowing students to pursue very different pathways. This flexibility also allows students majoring in other subjects to add Philosophy courses to their degree, and this distinctiveness gives an edge in the job market.
• Areas of specialisation in Philosophy at UC include ethics, bioethics, epistemology and metaphysics, logic, history of philosophy, and philosophy of science and technology, cognitive science and philosophy of mind, philosophy and foundations of computing, philosophy of artificial intelligence, philosophy of language, and political philosophy. There are also specialised courses on famous figures such as Plato, Descartes, Wittgenstein, and Turing.
• Philosophy Internships are increasingly popular with UC students; these provide a chance to hone skills, gain work experience, meet potential employers, and build a CV.
• UC is ranked in the top 200 universities in the world for Philosophy (QS World University Rankings by Subject, 2020).

Recommended background
Since philosophy is not always taught in schools, 100-level Philosophy courses at UC are designed for beginners.

Philosophy is for anyone who is intellectually inquisitive, likes ideas, and likes to think and explore. It is not just an academic subject but tackles issues and questions that arise for everyone. No special academic background is therefore required.

100-level courses
Each course involves two hours of lectures and one tutorial a week. A pass in a single 100-level Philosophy course allows you to enrol in any 200-level Philosophy course.

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>PHIL 110</td>
<td>Science: Good, Bad and Bogus</td>
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<tr>
<td>PHIL 111</td>
<td>Philosophy, Sex, and Thinking</td>
</tr>
<tr>
<td>PHIL 132</td>
<td>God, Mind and Freedom</td>
</tr>
<tr>
<td>PHIL 133</td>
<td>Philosophy and Human Nature</td>
</tr>
<tr>
<td>PHIL 137</td>
<td>Computers, Artificial Intelligence and the Information Society</td>
</tr>
<tr>
<td>PHIL 139</td>
<td>Ethics, Politics and Justice</td>
</tr>
</tbody>
</table>

200-level and beyond
There is a broad menu of 200-level Philosophy courses at UC, ranging from Ancient Greek philosophy to philosophy of cyberspace, from medical ethics to mathematical logic. A student with no 100-level Philosophy courses but with good results in other appropriate courses can enrol in 200-level Philosophy.

At 300-level, courses are usually offered in contemporary philosophy, history of philosophy, political philosophy, philosophy of religion, mathematical logic, philosophical logic, and ethics and bioethics.

www.canterbury.ac.nz/courses

Career opportunities
The intellectual skills that Philosophy teaches lead to success in many different careers. Philosophy graduates are sought after by industry, government, education, and the financial sector. Many sectors increasingly require people who can think independently and creatively, write clearly, apply logic, solve abstract problems, and communicate precisely. This is what Philosophy students learn to do.

Internationally, Philosophy has been recognised as providing excellent preparation for careers in medicine, business, and law.

Recent UC graduates in Philosophy have become policy analysts, lawyers, web developers, teachers, environmental and sustainability advisors, research managers, popular science writers, claims analysts, video game designers, e-learning executives, engineers, film-makers, doctors, business analysts, publishers, editors, science journalists, software engineers, technical writers, university administrators, and university lecturers.

Many of our graduates have gone on to further study in Aotearoa New Zealand or overseas.

www.canterbury.ac.nz/careers/students/subjects

Te Kura Kete Aronui | School of Humanities and Creative Arts
T: +64 3 369 3377
E: artsdegreevice@canterbury.ac.nz
www.canterbury.ac.nz/arts/schools-and-departments/philosophy

Physics
CertSc, BA (minor only), BCom (minor only), BSpC (minor only), BYCL (minor only)

What type of student might consider a Physics degree? As a child, famous UC alumnus Ernest Rutherford was intrigued by seeing a stick apparently bend when dipped into a farm bucket of water; Albert Einstein asked how his face would appear in a hand-held mirror if he ran at some significant fraction of the speed of light. A budding physicist may share this fascination with and curiosity about the natural world.

Physics aims to understand the behaviour of matter and energy from the scale of subatomic particles to that of the universe itself. From computers to communication systems, architecture to agriculture; modern life is overwhelmingly built using the understanding of nature that physics provides.

We are currently in an incredibly exciting period in Physics. The technological advances of the last 20 years have had an enormous impact on all our lives and almost all of these rely on advances in Physics. Modern physics provides a framework for understanding — and contributing to — major advances in technology now and in the future.

Why study Physics at UC?
UC physicists are currently involved in the following exciting projects:
• building huge laser equipment to study gravitational waves
• creating tiny nanoelectronic devices that can act as transistors or sensors
• measuring the behaviour of the upper atmosphere in order to understand global warming
• obtaining fundamental theoretical understandings of cosmology and subatomic physics.

Te Kura Matū | School of Physical and Chemical Sciences has many collaborations nationally and internationally that give access to some of the best facilities around the world. For example, UC is a member of CERN, the enormous particle accelerator centre in Geneva and also collaborates with the Van der Veer Institute and hospitals on medical imaging and radiation therapy.
The Ōtautahi Christchurch Aerospace Strategic Plan aims to make the city the centre of Aotearoa New Zealand’s aerospace technology sector by 2025, which will extensively use UC’s facilities and research programmes, and offer students internships and other entrepreneurial opportunities in the industry.

UC is ranked in the top 250 universities in the world for Physics and Astronomy (QS World University Rankings by Subject, 2020).

Recommended background

Certain courses require a strong background in Year 13 physics and calculus. If students don’t have a strong background in physics and calculus, they may need to take both PHYS 111 Introductory Physics for Physical Sciences and Engineering and MATH 101 Methods of Mathematics.

Where you start in first year will depend on your secondary school results. See 100-level courses below for more details.

100-level courses

We offer Physics courses suitable for four different purposes:

• for studying Physics or Astronomy
• for studying Engineering
• for studying Biological or Environmental Sciences
• for philosophical or general interest.

The core first-year Physics courses are offered as a sequence. Where you start Physics depends on how well you have done in NCEA Level 3 physics and calculus (or an equivalent background eg, IB/Cambridge or overseas qualifications).

<table>
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<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>PHYS 101</td>
<td>Engineering Physics A: Mechanics, Waves, Electromagnetism and Thermal Physics</td>
</tr>
<tr>
<td>PHYS 102</td>
<td>Engineering Physics B: Modern Physics and Electromagnetism (2)</td>
</tr>
<tr>
<td>PHYS 111</td>
<td>Introductory Physics for Physical Sciences and Engineering</td>
</tr>
</tbody>
</table>

Students with 14 credits of NCEA Level 3 physics and calculus (or IB/Cambridge equivalent) can enrol in PHYS 101, in order to advance into a full second-year Physics or Astronomy programme, or to meet the Engineering Intermediate Year Physics requirements.

Those students who have not gained this credit standard will be advised to enrol in an introductory Physics course, PHYS 111. This course will build a solid foundation before enrolling in the Semester 2 Physics course, PHYS 101, thus completing the Engineering Intermediate Year Physics requirements. The second semester Physics course PHYS 102 is also offered over the summer period.

Students intending to advance in Physics must take MATH 102 Mathematics 1A and MATH 103 Mathematics 1B in their first-year courses. It is strongly recommended that you also take COSC 121 Introduction to Computer Programming or COSC 131 Introduction to Programming for Engineers.

200-level and beyond

The Physics courses beyond first year at UC include such topics as: astrophysics, classical mechanics, electricity and magnetism, electronics, atomic and molecular physics, nuclear and particle physics, optics, dynamics of atmospheres, quantum mechanics, relativity, signal analysis, solid state physics, and thermal physics.

www.canterbury.ac.nz/courses

Career opportunities

Many of our graduates are employed as physicists and can be found at Crown Research Institutes, the National Radiation Laboratory, medical physics departments of hospitals or universities, and the Meteorological Service, among others.

Some Physics graduates are not employed as scientists — however, their analytical skills, numeracy, and all-round thinking ability are in demand in many industries. Some of these graduates are snapped up by the IT and electronics industries, but those same skills are equally valued by merchant banks, stock brokers, and other financial services companies, as well as by the armed services, police, and aerospace industries (including airlines such as Air New Zealand).

Teaching, journalism, and science communication also need people with Physics training.

www.canterbury.ac.nz/careers/students/subjects

‘I have always been a science student at heart. I enjoy understanding physical concepts, being able to rationalise different physical situations, and then explaining to my peers how they work. Consistent hard work and a persevering attitude is key.

In my last year of high school I was at a 5-day experience attending lectures at UC on various topics of astrophysics, and night observing at the Mount John Observatory. After this, I was thoroughly fascinated by how space worked and decided to explore it further as a part of my physics study at UC.’

Rosemary

Bachelor of Science in Astronomy and Physics

Studying towards a Master of Science in Astronomy

Te Kura Matū | School of Physical and Chemical Sciences
T: +64 3 369 3100
E: physical-chemical-sciences@canterbury.ac.nz
www.canterbury.ac.nz/science/schools-and-departments/phys-chem/physics
‘I really enjoy learning about what humans have been able to find out about themselves. We’ve been able to reveal casual mechanisms in so many aspects of everyday life, from learning to eat food to how the brain affects behaviour. There’s obviously so much we still don’t know but it’s exciting knowing it’s possible to make a significant difference in many people’s lives.

I’ve been able to develop a lot of different skills, which will be extremely important for life after university. Some papers require presentations which help with public speaking skills, and there’s lots of written assessments so my writing has really improved as well. The topics are also interesting, with many courses providing the option for critical thinking.’

James
Certificate in University Preparation
Bachelor of Science in Psychology
Studying towards a Bachelor of Science with Honours in Psychology
Triage/Clinical Support Worker and Volunteer Helpline Counsellor, Youthline

Psychology
CertArts, CertSc, BA, BHSc, BSc, BCom (minor only), BSpC (minor only), BYCL (minor only)

Psychology is the scientific study of behaviour and associated biological, cognitive, and social processes in humans and other animals. It is a rapidly developing field touching on all aspects of human life. Advances in neuro-imaging and molecular biology are rapidly enhancing our understanding of how the brain works, while increasingly complex theories are being developed to understand both normal and abnormal development and the behaviour of individuals and groups. Major advances are being made in understanding and treating psycho-pathologies such as anxiety, depression, eating disorders, and addictions.

Psychology students are trained to:
• think independently and critically about psychological issues
• become knowledgeable about the key methods, important findings, and major theories of psychology
• learn how to distinguish genuine findings from implausible and suspect claims
• understand modern scientific research in psychology.

Why study Psychology at UC?
• UC is ranked in the top 250 universities in the world for Psychology (QS World University Rankings by Subject, 2020).
• UC offers a balanced and comprehensive set of courses, excellent opportunities to undertake work in experimental psychology, and has nationally and internationally recognised postgraduate applied programmes in Applied Psychology, Child and Family Psychology, and Clinical Psychology (leading to professional registration as a psychologist).
• UC has more than 25 specialist academic staff offering a diverse range of research and teaching options. With a large number of undergraduate and postgraduate students, we seek to foster close working relationships between staff and students. Undergraduate students from 100-level courses onwards can become involved in research projects and may make significant contributions to the discipline.
• Te Kura Mahi ā-Hirikapo | School of Psychology, Speech and Hearing provides students with modern computer-based laboratories; excellent digital recording and editing equipment; an extensive library of psychological tests; and laboratories for human performance, human robot interaction, animal behaviour and neuroscience, perception and cognition, and social, developmental, and applied psychology.
• UC has a Psychology Clinic where clinical students receive training, and has working relationships with Te Poari Hauora o Waitaha | Canterbury District Health Board, and Ara Poutama Aotearoa | Department of Corrections, offering opportunities for research and clinical internships.

Recommended background
Psychology is presented and taught as a science, but students from both arts and science backgrounds find the study of Psychology an interesting and worthwhile challenge.

Being able to write clearly and lucidly is a key skill for psychologists. Increasingly, Psychology has come to incorporate findings from neuroscience, making some background knowledge in biology very useful. Students use statistical methods in analysing and treating research data, meaning a background in statistics is helpful. Competence in mathematics at Year 11 and basic computer skills are assumed.

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>PSYC 105</td>
<td>Introductory Psychology — Brain, Behaviour and Cognition</td>
</tr>
<tr>
<td>PSYC 106</td>
<td>Introductory Psychology — Social, Personality and Developmental</td>
</tr>
</tbody>
</table>

PSYC 105 is taught in the first semester and PSYC 106 is taught in the second semester. Both PSYC 105 and PSYC 106 include weekly two-hour laboratory classes. These labs offer the opportunity for students to experience first-hand some of the phenomena discussed in lectures and the text, and also incorporate an introduction to the research methods and statistics employed in Psychology. Taken together, the two courses provide a broad general introduction to Psychology. As the Department regards them as essential joint prerequisites for 200-level Psychology courses, first-year students are required to enrol in both courses.

200-level and beyond
At 200 level, courses include: cognition; developmental psychology; personality; sensation and perception; social psychology; as well as a core course in research design and statistics (PSYC 206 Research Design and Statistics).

300-level courses include: abnormal psychology; biological psychology; cognitive psychology; family psychology; health psychology and behavioural change; industrial and organisational psychology; learning and behavioural analysis; judgement and decision making; environmental psychology; plus an advanced course in research methods.
For a major in Psychology, four courses (including PSYC 206) are required at 200-level. In addition, to be eligible to enter postgraduate programmes in Psychology (eg, Applied Psychology, Child and Family Psychology, and Clinical Psychology), students must have passed certain 300-level courses.

www.canterbury.ac.nz/regulations

BA or BCom students may wish to complete a minor in Psychology. This requires passing PSYC 105 and PSYC 106 and a further 45 points in advanced PSYC courses (200 and 300-level courses).

www.canterbury.ac.nz/courses

Career opportunities

Psychologists have a unique mix of skills. As well as a basic knowledge about people, as individuals and in groups, they are required to have excellent writing and communication skills, the ability to analyse and understand quantitative data, and a critical and objective way of approaching problems.

Psychology graduates hold research and policy analyst positions in government departments and other large public sector organisations, as well as positions of responsibility in a variety of settings, including many private sector businesses. Many graduates are employed in public relations; teaching and training; district health boards; the New Zealand Defence Forces; Ara Poutama Aotearoa | Department of Corrections; and in social service agencies such as employment services, social welfare, counselling services, and health promotion.

Further specialist opportunities open up for those who have completed postgraduate training in Applied Psychology, Child and Family Psychology, and Clinical Psychology (leading to professional registration as a psychologist). Clinical psychologists work with individuals and their families where there are difficulties in adjustment and coping.

www.canterbury.ac.nz/careers/students/subjects

Speech and Language Pathology

BSLP(Hons)

Speech-language therapists/pathologists are professionals educated in the study of human communication, how it develops and the many differences and difficulties that children and adults experience.

Speech-language therapists/pathologists work in preschools and schools with children and students who have difficulty communicating and learning. This includes supporting children who stutter, have autism, or have a voice disorder.

Speech-language therapists also work with infants born prematurely and provide services for adults who have lost the ability to communicate or swallow effectively due to stroke, degenerative disease, brain injury, or cancer.

Why study Speech and Language Pathology at UC?

- The Speech and Language Pathology programme at UC is the first in the country to be accredited by Te Kāhui Kaiwhakatikatika Reo Kōrero o Aotearoa New Zealand Speech-language Therapists’ Association (NZSTA), the organisation that sets quality standards for speech-language therapy courses in Aotearoa.
- As a hands-on qualification, it will provide clinical experience working with clients of all ages. There are eight clinics on campus and you will also go on placement to speech-language therapy clinics at hospitals, schools, and other facilities nationwide. There are also opportunities for overseas clinical placements.
- Te Kura Mahi ā-Hirikapo | School of Psychology, Speech and Hearing has 12 full-time staff and is a national resource centre for information and continuing professional education in communication sciences and disorders. Each year the Department welcomes a number of distinguished scholars from around the world, including Erskine Fellows who lecture and conduct collaborative research in the Department.

Recommended background

Entry to the Intermediate Year of study (first-year) is open to all students eligible to enter the University. The recommended preparation for the Intermediate programme is a science background to at least Year 13 and work experience, including visits to meet people with different speech and language abilities.

A good level of English and any prior knowledge of languages eg, te reo Māori, is also useful.

100-level courses

The first year of the BSLP(Hons) is called the Intermediate Year. Entry to the professional years is limited and selection is made at the end of the Intermediate Year.

The Intermediate Year has three compulsory courses and four recommended courses. They may be taken in one full-time year of study or accumulated over more than one year. It may be possible to take some, but not all, components of the Intermediate Year at other universities — if you are intending to do this you should seek approval of your course of study from Te Rāngai Pītaiao | College of Science Student Advisor.

The compulsory first-year courses are:

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<tr>
<th>Course code</th>
<th>Course title</th>
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<tbody>
<tr>
<td>CMDS 161</td>
<td>Anatomy and Physiology for the Speech, Hearing and Swallowing Mechanism</td>
</tr>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
<tr>
<td></td>
<td>Plus one course from HLTH 106, MAOR 165, SCIM 101/MAOR 172, TREO 110, or TREO 111.</td>
</tr>
</tbody>
</table>

200-level and beyond

The one-year Intermediate programme is followed by three full-time years of specialised professional training — the professional years. Entry to the First Professional Year is limited (see below). In the professional years, students complete coursework covering a wide variety of topics in normal and disordered aspects of speech, language, swallowing, and hearing. The academic coursework is taken in combination with fieldwork, which is an important component of the professional years.

The professional years

Entry into the First Professional Year

Students are selected on the basis of academic merit (normally a B+ or better average) and fluency in spoken and written English. Relevant work experience with people who have communication disorders may also be considered when selection decisions are made.

Applications for entry for the First Professional Year close on 1 October.
Application forms are available from www.canterbury.ac.nz/science/schools-and-departments/communication-disorders/undergraduate-study and intending applicants should contact the BSLP Programme Coordinator at least a month before the closing date. Late enrolments will be considered if places are still available. If a student is unsuccessful in gaining a place in the First Professional Year, all courses passed can normally be credited to another degree.

Te Rāngai Pūtaiao | College of Science Student Advisor is available to advise students on their options.

What do the professional years look like?

In the First Professional Year (second year of study), students take courses in speech and language development and disorders, evidence-based practice, clinical linguistics, and audiology. They are also introduced to the observation and assessment of individuals with communication difficulties and the distinguishing characteristics of the major types of communication disorders.

In the Second Professional Year (third year of study), students continue studying different types of communication disorders, predominantly those of neurogenic origin, conduct applied research in clinical settings and gain practical experience with clients. They work with practising therapists and complete coursework in education and medical settings.

In the Third Professional Year (fourth year of study), more time is spent on research and taking responsibility for the assessment of clients and the planning, management, and evaluation of therapy programmes.

Fieldwork

Practical work is introduced from the second year of study. This fieldwork accounts for about 25% of the year’s work in the second year, 30% in the third, and 50% in the final year. Students have the opportunity to undertake work with practising therapists and people of all ages and backgrounds in a variety of settings, including preschools, schools, hospitals, and clinics in Ōtautahi Christchurch and throughout Aotearoa. 

www.canterbury.ac.nz/courses

Career opportunities

The speech-language therapy/pathology profession offers a range of career opportunities. Graduates are highly employable as clinicians both in Aotearoa New Zealand and overseas.

As a graduate of UC’s BSLP(Hons) programme, you will be able to work in a variety of settings. You can work with children who have autism or language delays in preschools and schools or with elderly stroke patients in a large hospital or nursing home. You can be an entrepreneur, developing and marketing new communication devices and tests, or building your own private practice. With further postgraduate study, you can teach at a university, conduct research in a scientific laboratory, or be an administrator. Perhaps best of all, you can combine several of these to establish a challenging and satisfying career that improves the quality of life for children and adults who experience communication difficulties.

www.canterbury.ac.nz/careers/students/subjects

‘I chose UC since it is known worldwide to provide quality education and support for its students, to ensure that we graduate as therapists with not only theoretical knowledge but plenty of valuable hands-on experience.

I have experienced working with adults with intellectual disabilities who use augmentative and alternative communication (AAC) devices to communicate, and have also had the opportunity to meet and build rapport with adults with aphasia. I have also worked with adult stroke patients at the Christchurch hospital who had swallowing problems. Last year I engaged with primary and pre-school children through observations.

Here I am, ready to take on the challenges and exciting adventures that await me on this BSLP journey!’

Naomi
Studying towards a Bachelor of Speech and Language Pathology with Honours
Why study Statistics at UC?

• Every year Te Kura Pāngarau | School of Mathematics and Statistics welcomes visiting scholars on the Erskine Fellowship Programme. Students benefit greatly from their teaching and the alternative perspectives they offer.
• The School is active in supporting and promoting undergraduate research through summer projects and honours dissertations, with some of our recent budding scholars heading to Oxford, Harvard, and Yale for postgraduate work.
• Here at UC, we have a thriving culture that encourages meeting up with like-minded students through clubs.
• UC has been recognised internationally for our teaching of statistics to first-year students.

Recommended background

Entry into the 100-level Statistics course is open to all students with entry to the University. Logical thinking, a flair for numbers, curiosity, and the ability to live with uncertainty are the qualities that combine to make a good statistician. In school, it is important to do as well as possible in Year 13, particularly in statistics and/or calculus.

Students who have performed very well in Year 13 statistics and/or calculus may be eligible for direct entry into a 200-level Statistics course.

100-level courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 101</td>
<td>Statistics 1</td>
</tr>
</tbody>
</table>

The introductory Statistics course STAT 101 is designed to provide students with a solid background in statistics, critical thinking, and in the use of computers. Students use computers to graph and analyse data. Even if you are not majoring in Statistics, learning how to use Excel spreadsheets will still be a very useful part of your education at UC. This course is taught using a novel approach, with fewer classroom-style lectures and more computer-based learning through online tutorials. There is a strong emphasis on using computers to work with data. Student feedback on this approach to learning has been very positive.

If you are planning to major in Statistics, it is recommended that you take STAT 101 and MATH 103 (or DATA 203 in your second year) depending on which degree you wish to obtain – see the regulations for the Bachelor of Arts and the Bachelor of Science.

200-level and beyond

Five 200-level courses are offered, covering a range of topics from data analysis through to inference and probability. If you are majoring in Statistics, you need three courses from STAT 201–294 and four courses from STAT 310–394; MATH 103 (or MATH 199, a STAR course only available to secondary school students) or DATA 203 is also required.

If you are unsure which courses best suit your needs, contact a Student Advisor. It is good to include other subjects at 200-level. Popular choices include Mathematics, Management, Economics, Physics, Chemistry, and Computer Science.

www.canterbury.ac.nz/courses

Career opportunities

Statistics is an integral part of many industries, management, and scientific research programmes. Statistics demands the ability to use analytical techniques, statistical methods, and information technology for the manipulation and interpretation of information. There is a growing demand for statisticians and biometricians (people who conduct research and advise on experimental design, data collection, and data analysis in biology).

Many of our graduates are employed by Tatauranga Aotearoa | Stats NZ as statisticians, and in other organisations as research officers, analysts, and statistical programmers. Crown Research Institutes also employ a large number of statisticians, particularly biometricians. Other graduates are employed in the financial sector and by insurance companies, and industrial and commercial companies. Many large companies employ statisticians to deal with the increasing demand for the collection and interpretation of data.

Many other jobs, while not requiring people with a degree in Statistics, need employees with a working knowledge of statistics, in particular competence in using statistical software packages.

www.canterbury.ac.nz/careers/students/subjects

Te Kura Pāngarau | School of Mathematics and Statistics
T: +64 3 369 2333
E: enquiries@math.canterbury.ac.nz
www.canterbury.ac.nz/engineering
www.canterbury.ac.nz/subjects/mathematics-statistics
Congratulations on choosing a career in science. The next step is to decide what area of science you want to study.

There is no right or wrong way to decide what to study. The most important thing is to follow your interests. For inspiration and guidance, talk to your teachers, careers advisors, UC staff or people you know who are working in science. Think about the problems you'd like to solve or areas you'd like to work in.

Have a look at the degrees outlined in this brochure and look at all the subjects on offer. If you're still not sure, don't worry — get in touch with our Student Advisors. They can work through the options with you and answer any questions you might have. If you already have a career in mind they can help you find the ideal degree and subjects to achieve your goals.

### Ready to start?

1. Search courses and qualifications: [www.canterbury.ac.nz/courses](http://www.canterbury.ac.nz/courses)
2. Explore subjects you enjoy or might be interested in: [www.canterbury.ac.nz/study/subjects](http://www.canterbury.ac.nz/study/subjects)
3. Match your subject choices with the degree or degrees that delivers them.
4. Get in touch with a UC Student Advisor for extra help and advice.
5. Enrol in your degree: [www.canterbury.ac.nz/enrol](http://www.canterbury.ac.nz/enrol)

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### If you like this subject at school...

<table>
<thead>
<tr>
<th>Subject</th>
<th>You might like to study these subjects at university*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology</strong></td>
<td>Antarctic Studies, Audiology, Biochemistry, Biological Sciences, Chemistry, Geology, Medicinal Chemistry, Physics, Psychology, Water Resource Management, Environmental Science, Ecology, Biosecurity, Biotechnology, Speech and Language Pathology</td>
</tr>
<tr>
<td><strong>Calculus</strong></td>
<td>Physics, Mathematics, Chemistry, Computer Science, Astronomy, Physics, Statistics, Biochemistry, Economics, Financial Engineering</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>Biological Sciences, Water Resource Management, Environmental Sciences, Biosecurity, Biotechnology, Biochemistry, Chemistry, Geology, Ecology, Physics, Medicinal Chemistry</td>
</tr>
<tr>
<td><strong>Classics and history</strong></td>
<td>Philosophy, Economics</td>
</tr>
<tr>
<td><strong>Earth and space science</strong></td>
<td>Geology, Geography, Astronomy, Hazard and Disaster Management, Environmental Science, Water Resource Management, Physics, Antarctic Studies</td>
</tr>
<tr>
<td><strong>English</strong></td>
<td>Philosophy, Linguistics, Speech and Language Pathology</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>Geography, Antarctic Studies, Biological Sciences, Geology, Water Resource Management, Ecology, Biosecurity, Environmental Science, Economics</td>
</tr>
<tr>
<td><strong>Languages</strong></td>
<td>Computer Science, Linguistics, Speech and Language Pathology</td>
</tr>
<tr>
<td><strong>Physics</strong></td>
<td>Astronomy, Biochemistry, Biological Sciences, Chemistry, Computer Science, Geology, Mathematics, Philosophy, Statistics, Physics</td>
</tr>
<tr>
<td><strong>Social studies</strong></td>
<td>Psychology, Geography, Philosophy, Economics, Statistics</td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
<td>Biology, Physics, Mathematics, Geography, Statistics, Psychology, Computer Science, Economics</td>
</tr>
<tr>
<td><strong>Te Reo Māori and Te Reo Rangatira</strong></td>
<td>Environmental Science, Ecology, Biosecurity, Biotechnology, Biological Sciences, Astronomy, Geography, Medicinal Chemistry</td>
</tr>
</tbody>
</table>

*For a full list of UC Science subjects, go to [www.canterbury.ac.nz/science/subjects](http://www.canterbury.ac.nz/science/subjects)
Who can help me with my degree questions and general questions?

You can make contact with a Student Advisor from Te Rāngai Pūtaiao | College of Science, or if you are a Māori student, a Kaiurungi from Te Tari o te Amokapua Māori | Office of the AVC Māori, who is able to help with degree planning, majoring and subject combination questions. The Student Advisor or Kaiurungi are able to refer you to other UC departments and services that will help you as you study for your degree.

What other support is available for me at UC?

We are committed to helping you thrive and succeed with a wide range of support services:

- Te Pokapū Pūkenga Ako | Academic Skills Centre can help you hone your assignment, essay, presentation, and exam preparation skills.
- If you have a learning difficulty, mental health issues, physical impairment, or other condition that may affect your study (including temporary ones), Te Ratonga Whaihaka | Equity & Disability Service (EDS) can assist you.

Frequently asked questions

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Science

I haven’t studied some science subjects at school (eg, chemistry, geography). Can I start these subjects at university?

You can study some subjects in a BSc without any previous knowledge; however, we strongly recommend you have at least a good grounding in numeracy. Mathematics, Physics, and Chemistry all offer Semester 1 introductory courses, which will allow a pathway into advancing courses.

What can I do if I don’t have a background in Science?

UC offers a number of courses designed to bring you up to speed. In the month before the start of Semester 1, Headstart courses are offered in key areas including Mathematics, Statistics, Chemistry, and Physics, as well as a general academic skills course.

I’m only interested in studying one subject. Can I do this?

As your first year of study requires up to eight individual courses, you must take more than one subject. We recommend taking the required courses in your preferred major or minor subject, and preferably in another major subject as well (in case you change your mind or wish to study a double major). There will be further spaces in your timetable, so we recommend looking at subjects that interest you. As you progress into 200 and 300-level courses you will be able to choose more courses in your subject to give you greater knowledge in that area.

There are subjects that are complementary — you should talk to Liaison or the Student Advisor for help on this.

- Te Tari o te Amokapua Māori | Office of the AVC Māori can support you and your whānau through a wide number of initiatives, from enrolment right through to graduation.
- The Pacific Development Team supports Pasifika students and is here to boost your student experience, both academically and socially.
- Student Care Advisors offer life skills training and one-to-one practical advice for anyone dealing with social, cultural, or personal concerns.

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www.canterbury.ac.nz/support
www.canterbury.ac.nz/science
www.canterbury.ac.nz/engage
/school-resources/liason
Can I do a double major in a BSc? How long will this take?

Yes, it is possible to do a double major and your first year will be flexible enough to keep this option open. Most majors can be completed within the standard three years; however, some double major combinations might take a little longer. A minor is another subject within your degree, or the Bachelor of Arts, Bachelor of Commerce, and Bachelor of Sport Coaching list of minors. You can also study a minor in Youth and Community Leadership.

Forestry Science

What career opportunities are available to UC Forestry Science graduates?

The degree is very well supported by employers in Aotearoa New Zealand. Students are able to make employer contacts through New Zealand Institute of Forestry meetings and lectures on campus. These contacts can also provide summer work opportunities.

Some of the biggest companies in Aotearoa hire UC graduates and many students obtain work overseas. Of those choosing to enter the workforce, the majority of our graduates are employed by the time they finish their degree.

Possible careers include forest management or consultancy (plantation and native forests), conservation, harvesting, wood processing, planning, policy, forest science, timber appraisal, biosecurity, forest economics, sustainability, and land management.

www.canterbury.ac.nz/careers

Health Sciences

Can I study some Health courses within another degree?

It will depend on what degree you are studying but many degrees do give you the opportunity to choose elective courses from outside your specialisation area. For example, many students choose to do a course on nutrition or strength and conditioning. It can provide a change from their usual studies and give them knowledge that is beneficial to their own health and wellbeing. Once you are enrolled at UC, check with your student advisor to see what possibilities you may have.

Te Rāngai Ako me te Hauora | College of Education, Health and Human Development

Student Advisors can help you with:

- part-time enrolment
- transfer of credit from other Aotearoa New Zealand tertiary institutions
- cross-credit
- transferring between qualifications
- workload
- explaining your course options.

Speech and Language Pathology

How many places are there in the Speech and Language degree?

Entry into the first year ('Intermediate Year') of the degree is open to anyone who gains University Entrance. Students apply for a place in the professional years of the degree, which is based on your first-year grades. Places in First Professional Year are limited to 40 students.

Who should I contact for advice on the Bachelor of Health Sciences?

Te Rāngai Ako me te Hauora | College of Education, Health and Human Development

Student Advisors can help you with:

- part-time enrolment
- transfer of credit from other Aotearoa New Zealand tertiary institutions
- cross-credit
- transferring between qualifications
- workload
- explaining your course options.

To make an appointment, please contact:
T: +64 3 369 3333
E: educationadvice@canterbury.ac.nz
www.canterbury.ac.nz/education
/student-advice-and-forms
Useful UC links

Enrol
www.canterbury.ac.nz/enrol

Fees
www.canterbury.ac.nz/get-started/fees

Code of Practice
www.canterbury.ac.nz/support/code

Clubs and Societies
www.canterbury.ac.nz/life/studentlife/clubs

Support Services
www.canterbury.ac.nz/support

Te Rōpū Takawaenga | Liaison Office
www.canterbury.ac.nz/engage/school-resources/liaison

Te Rōpū Rapuara | UC Careers
www.canterbury.ac.nz/careers

Te Waka Pākākano
www.canterbury.ac.nz/support/akonga-maori

UC Pasifika
www.canterbury.ac.nz/support/pasifika

Whare Hauora | UC Health Centre
www.canterbury.ac.nz/healthcentre

Emergency
www.canterbury.ac.nz/support/emergency

On campus
0800 823 637 or (03) 364 2111

Police, fire, or ambulance
111
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UC

OPEN DAY
RĀ TŌMENE

Discover your degree options. Find out about student life and our amazing campus.

For more information, visit www.canterbury.ac.nz/openday