

New Zealand School of Forestry | Te Kura Ngahere
Prospectus | Whakatairanga



Grow | E tipu



New Zealand School of Forestry
Te Kura Ngahere

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Front cover photo: *Aracaria columnaris* (Captain Cook's Pine), (Roger Sands)

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Welcome to the School of Forestry

Nau mai, tauti mai ki Te Kura Ngahere

Forestry: what's in it for me?

Now there's a good question! There are many answers:

- a surprising array of career options on graduation
- interesting, diverse courses, covering topics from the sciences to social policy
- easy entry into some of New Zealand's most important and rewarding careers
- a great university experience!

Later in this Prospectus, you'll see the list of courses taken in our degree programmes. They include sciences, management, economics and engineering. Such a range of study will set you up for a broad spectrum of career options, including positions in business, government, consulting and contracting; in fields as wide-ranging as conservation, environmental protection, biosecurity, forest management, forest operations and forest policy.

Your talents will be needed in Aotearoa New Zealand, where the forest sector is the country's third most important industry, and abroad. Knowledgeable foresters and resource management professionals are needed all over the world.

How will we help you acquire the skills you'll need?

We have an average of 120 students enrolled in our undergraduate programme each year, 25 students in the professional years of the forest engineering programme and 25 students in the postgraduate programmes. This translates into smaller classes than is the norm in other degree programmes, and the attention that comes with small student/staff ratios.

You'll find the School a hive of activity, with field trips, a vibrant student society (FORSOC), and student exchange programmes with the University of British Columbia and Virginia Polytechnic Institute and State University.

Forestry Students: where do they come from, where do they go?

In a word, everywhere! In any given year, we have students who have come to the School from Invercargill to Northland, and we have Coasters and Cantabrians. Our international students come from China, Chile, India, Iran, Poland, Korea, Singapore, Switzerland and Sri Lanka. Among the undergraduate students, 25% are women and 15% have iwi affiliations. While there are a handful of overseas students in the undergraduate programme, the postgraduate programmes attract many overseas scholars, and to date students from 39 countries have taken degrees with us.

Our graduates enter every aspect of the forestry wood-based industry and resource management areas you can imagine, and probably a few others that would surprise you. The majority of final year BForSc and BE(Hons) students have received an offer of employment before they complete their final exams. Offers come from a range of businesses including Australian forest industry companies who remain impressed by the quality of our students. Those students who do not have a job at the end of final exams are generally considering postgraduate study or their OE.

The changing face of forestry

The School of Forestry | Te Kura Ngahere offers courses that have focused forestry content and consequently are directly relevant to the workplace. Employers tell us that they value the skills the students learn within the degree, making our graduates sought after in Aotearoa New Zealand and overseas. The qualification has a solid core of subjects but new developments are continuously being added.

We are seeing an increasing awareness in Aotearoa New Zealand and elsewhere of the diverse roles that forests play. Forests have long been seen as important for the Aotearoa New Zealand economy – forest products make up 10% of total exports. However, forests are now being seen as important because of their environmental and social benefits. Carbon sequestration, erosion reduction, water quality improvement and better biodiversity outcomes are some of the environmental benefits from forests. For example, the Emissions Trading Scheme has carbon sequestration by plantations as its centrepiece.

Te Uru Rākau | Forestry NZ

The Government's One Billion Trees programme has put forestry at centre stage. The 10-year plan to plant a mix of exotic and native trees on private, public and Māori-owned land is large-scale and ambitious. It will further increase the demand for our graduates and provide additional opportunities for them in a wide range of roles including planning, forest operations, engineering, logistics and research.

These developments create additional research opportunities for undergraduate and postgraduate students as well as employment prospects for our graduates. It is an exciting time to be doing a degree at the School of Forestry | Te Kura Ngahere.

I look forward to seeing you grow with us.



Professor Bruce Manley
Head of School | Tumuaki Kura

How did you come across UC's Forestry degree?

Pure chance – my best friend told me about the degree and sold it to me by saying we would spend more time in the forest and be able to build our own mountain bike tracks. I found the more I learnt through the degree, the more interesting study became, and the passion for forests developed rapidly.

What was it that kept you going?

The more you learn the more interesting it gets, and the passion for forests will grow from those roots! Our class did plenty of field trips and working experience through UC. These were some of the most memorable times of my early twenties.

What kind of things are involved with studying a Forestry degree?

The degree was more challenging than expected as foresters are required to have such a diverse array of understandings (Sciences, Mapping, Economics, Management, Marketing, Biosecurity, Silviculture, Harvest planning, Environmental planning, Carbon sequestration, Business, Health and Safety, and the list goes on...). But this has given me such an awesome base for my career.

Even if you don't stick to forestry in the long run, the skillsets are so diverse you will get opportunities to try jobs you may have never contemplated.

You've landed a couple of different roles since graduating, including being a Park Ranger. What does your work involve now as a Forester?

I am responsible for the management of Environment Canterbury's 2,700 hectares of forests, and work within the Parks and Forests Team based in Kainga, Christchurch. Our forests were primarily established for flood protection and soil conservation surrounding the volatile braided rivers across the Canterbury Plains. The regional parks have developed because of the forest establishment which house many community recreational values, plus host a range of biodiversity projects which are accelerating rapidly.



Since I am the only Forester I am involved with everything associated with the forest management, plus I am within wider organisational teams working on projects which draw on forestry skills.

In particular, the focus currently is afforestation and the NZ Emissions Trading Scheme and using these to work towards organisational goals such as protecting and enhancing biodiversity, increasing water quality, mahinga-kai, diversifying revenue generation, and improving land use.

How have you enjoyed looking after such an important resource?

It's very dynamic working for the council, and in a political environment where such a wide range of stakeholder expectations must be considered when making plans and decisions about forest management. With such a large stakeholder base and wide spanning organisational values, plus a spotlight on forestry, I have been able to begin accelerated growth of our forests plus lock in some budget for diversifying our forest estate for the benefits of biodiversity, parks values, carbon sequestration, and timber diversity.

It's really cool being able to use the BForSc degree to help influence forest related decisions at the higher-level and then get to implement them.

So what else are you hoping to achieve with our forests in the future?

Plenty, but in essence I want to develop both my own and others' abilities to manage land in ways that is sustainable for New Zealand given the issues we are facing currently and are expected to in the future, such as climate change and the biodiversity crisis, whilst benefiting social and economic factors too.

'This has given me such an awesome base for my career...'

Ben Tyas

Bachelor of Forestry Science

Forester, Kaunihera Taiao ki Waitaha | Environment Canterbury

School of Forestry | Te Kura Ngahere

School of Forestry | Te Kura Ngahere at UC | Te Whare Wānanga o Waitaha is the only university department in Aotearoa New Zealand which offers professional forestry degree programmes including the Bachelor of Forestry Science, Bachelor of Engineering with Honours in Forest Engineering, Postgraduate Diploma in Forestry, Master of Forestry Science and PhD in Forestry.

The School is a member of the College of Engineering | Te Rāngai Pūkaha.

The School has first class facilities for teaching and research. There are two interconnected buildings. The first contains lecture theatres, an undergraduate computer laboratory, undergraduate and postgraduate research laboratories and postgraduate offices.

The Wood Technology building is housed through a connecting walkway which contains wood technology laboratories, a timber drying unit and a general wood and metal workshop. The laboratories are equipped with a variety of tailor-made tools such as acoustic and mechanical tools used to assess the physical properties of timber; gas chromatographs and an infrared spectrometer to measure chemical components, along with microscopes, a fibre analyser and other general equipment.

A distinctive feature of both buildings is the extensive use of timber, both structural and decorative, to provide pleasant surroundings.

UC | Te Whare Wānanga o Waitaha has an excellent library with over 1.3 million items of which the Forestry collection forms one part.

Field trips are an integral part of many of our subjects and use is made of the forests, both indigenous and exotic, around Waitaha Canterbury. We have built up strong relationships with most of the forest organisations in Waitaha Canterbury, whose staff contribute greatly to these field trips.

There are many plantation and native forest areas, both publicly and privately owned, used for teaching and research within convenient range of the University. Further afield, the University field stations located near Arthur's Pass, at Kaikōura and Westport are close to extensive areas of indigenous forests.

Westport field station is used for practical courses and as a research centre by UC staff and students. It provides an excellent location for the study of native forests.

Students regularly visit several wood processing industries in Waitaha Canterbury with which we maintain regular contact.

Inter-faculty cooperation

Forestry degrees at UC make full use of the expertise available within the University. In this way, the resources of the School are augmented to offer intellectually challenging courses covering virtually any of the broad fields of forestry. Strong links operate between the College of Engineering academic departments (particularly Chemical & Process Engineering and Civil & Natural Resource Engineering), and also with departments within the Colleges of Science and Arts.

Graduate profile

The Forestry Science programme aims to provide students with the appropriate academic base and practical work experience from which they can develop into effective professional foresters. This implies graduates who are capable of independent thought, are aware of and responsive to society's needs, can communicate effectively, possess an excellent technical background relevant to forestry practice and are aware of the environmental, social and ethical context in which they will work.

International students

The School has a strong international student body at both undergraduate and postgraduate level. To date we have had postgraduates from close to 40 countries. If you are interested in applying for admission to any Forestry programme, you can get details on the application process, closing dates and scholarships at: www.canterbury.ac.nz/international

Forestry Students Society (FORSOC)

FORSOC was initially established in the first School of Forestry (1924-32) and re-established following the opening of the present school in 1970. The Society fosters social interaction between students and staff, publishes an annual magazine "Te Kura Ngahere" and organises social and sporting events throughout the academic year. The committee also organises memorable labelled clothing collections each year.

Scholarships

Not all awards fund the full four years of study and associated costs, but they certainly offset them and can also provide great opportunities for future summer or graduate employment. www.canterbury.ac.nz/get-started/scholarships/types/first-year/

Current Awards

UC Hiranga Scholarship – for Academic Excellence

(currently valued at \$5,000) for up to 500 first-year students who achieved NCEA Level 2 with Excellence

UC Horomata Scholarship – for Emerging Leaders

\$6,000 towards accommodation fees at a UC-recognised halls of residence in the year of tenure, or second year tuition fees, as well as an opportunity to participate in a UC-sponsored leadership programme.

UC School of Forestry High Achievers Awards

(5 awards valued at \$2,000 each), applications required with a closing date of 15 August, specifically for first year BForSc students. See also www.canterbury.ac.nz/scholarships

Hawkes Bay Forestry Group Forestry

Scholarship (currently valued at \$5,000 for one year for first year students enrolling in BForSc or BE(Hons) Forest Engineering. For information go to www.hbforestrygroup.co.nz.

Kāingaroa Timberlands Kaitiaki o te Ngahere

Scholarship (currently valued at all tuition and non-tuition fees) awarded to one student in the Bachelor of Forestry Science, covering all fees from the date of the award until degree completion – not exceeding four years (see www.tll.co.nz/employ).

Ngā Karahipi Uru Rākau Forestry Scholarships

(currently valued at \$8,000 each year for the four-year degree, and a paid internship with an appropriate employer in the forestry sector) to support students studying the Bachelor of Forestry Science and the Bachelor of Engineering (Honours) Forest Engineering specialisation. For more information, go to www.mpi.govt.nz/forestryscholarships. Applications open 1 June and close 15 August.

WIDE Trust Tertiary Scholarships support full or part-time study towards an undergraduate qualification relevant to an intended career in the forestry sector. Values have ranged from \$2,000 - \$5,000. For more information to go www.widetrust.org.nz. Applications are open every year, closing in late January.

It may not be everyone's first thought when it comes to careers in forestry, but for Amy it is the people that make the industry special.

'One of the best things about my job is that I get to meet and work with a wide range of people,' she says. 'I visit our crews, do health and safety and environmental audits, plus office work and meetings. It makes it very dynamic as I'm doing something different every day of the week.'

It was also what Amy enjoyed most about her experience at university.

'The School of Forestry at UC itself became almost like a second family, especially with the amount of time you end up spending there in the latter years,' she says. 'The lecturers and the students themselves are what really make it worthwhile. Lifelong mates are created between times of studying and having a good time!'

Amy says that she chose to study Forestry 'on a whim', but soon became sure it was the right decision.

'I had some input from my grandmother who took me out to visit a farm forester she knew. It wasn't until I was in the thick of it that I knew this is what I wanted to do.'

After completing her degree at UC, Amy landed her first job as a graduate with Rayonier New Zealand/Matariki Forests as a Log Production Coordinator, and is now currently a Harvest Planning Manager.

'The major part of my role involves supervising harvesting crews in terms of harvest planning, log quality, health and safety and the environment. I determine the weekly log grades to be cut based on customer orders and estimated grade outturn in the bush.'



Amy feels that her studies set her up well for this role and that in general there are many advantages to studying Forestry Science at UC.

'The degree provides a holistic understanding of the basics required to understand the day-to-day things that occur in the real world of forestry,' she says.

'I would say to others, definitely give it a go. You learn a vast range of skills such as management, economics, soils, wood science, harvesting, environmental forestry, biosecurity... the list goes on. The career paths are endless! Not only that but you get to meet a really awesome bunch of people!'

'It's very dynamic as I'm doing something different every day..'

Amy Jackson

Bachelor of Forestry Science with Honours
Harvest Planning Manager, Ernslaw One

Bachelor of Forestry Science *BForSc*

The structure of the BForSc degree offers exciting opportunities for study in a range of disciplines. The degree is management oriented, and requires some study of science, commerce and engineering subjects.

The first year combines four FORE100-level papers, a core Biology course, a Statistics course and two 100-level electives of your choice. (First year forestry students are not in fact committed to a forestry degree as almost all of their credits can be transferred to a BSc or a BCom.)

The first year may be taken at any Aotearoa New Zealand university – students intending to do this need to contact the School of Forestry for information on equivalent courses in the year they plan to study. Students who do not complete their first year at Canterbury will normally take FORE131 and FORE141 in the 2nd Year at Canterbury (refer to page 6). The FORE100 series of subjects are compulsory papers in the first year and the equivalent extramural paper for FORE111 must be taken by students at other New Zealand universities. You have the choice of semester with FORE105 (either 1st, 2nd or summer semesters). In subsequent years, this basic knowledge is applied to the forest situation. On completion of the degree students will have a broad competence, allowing them to work in any field in forestry and in other areas of land resource management.

Many forestry skills in management are highly relevant and transferrable to other sectors of the economy, where BForSc graduates are already working.

Entry

There is no restriction on numbers entering degree studies.

- Entry to Year 1 at UC is normally from NCEA Level 3 university entrance – we do not have pre-requisite subjects for entry to the BForSc
- Direct Entry to Year 2 courses may be from:
 - i) Other suitable first year courses at UC or elsewhere at other Aotearoa New Zealand universities;
 - ii) A completed NZ Certificate in Science with suitable subjects
 - iii) Year 13: in the case of students with very high Scholarship/NCEA credits



University equivalents

Canterbury Course	Equivalent Content
STAT101 – Statistics 1	Statistics
BIOL112 – Ecology, Evolution and Conservation	A course that includes the principles of ecology, behaviour, genetics, evolution and conservation biology
FORE111 – Trees, Forests and the Environment	Students to enrol in FORE105 – contact School of Forestry
FORE151 – Commercial Aspects of Forestry	A microeconomics course
Two 100-level electives	Any two courses totalling 30 points in subjects of your choice

Note: Students who do not complete their first year at Canterbury will normally take FORE131 and FORE141 in the 2nd Year at Canterbury

- Direct Entry to Year 3 may be from a completed Bsc or other degree with passes in suitable subjects
- Students with a completed NZ National Diploma in Forestry qualification may be granted a special course of study in recognition of their previous training.

There are no subject requirements. However, we recommend Year 13 Biology and Maths (including Statistics and Probability). Chemistry and English would also be useful.

Interested students should communicate with the School of Forestry | Te Kura Ngahere at UC. Students intending to study forestry in their first year at University should pre-enrol for the subjects shown on page 6.

The same procedure applies for applicants taking their first year at other universities. These students should communicate with the the School of Forestry | Te Kura Ngahere at UC before the end of January (earlier if possible) in the year in which they intend to commence, so that an appropriate set of papers may be agreed on before enrolment. The email contact for the School of Forestry is forestry@canterbury.ac.nz.

Students who decide to transfer to a BForSc after completing one year or more of another degree should have a minimum of 120 points including passes in Biology and Statistics. It may be possible to proceed if one of these subjects has not been taken, provided that a good grade average has been achieved overall. Again, students should contact the School of Forestry | Te Kura Ngahere in the first instance.

Financial support, if sought and where relevant, may be available through Ministry of Māori Development | Te Puni Kōkiri or private forestry companies. In any given year there will be scholarships you may be eligible for. Some you must apply for, others you will automatically be considered for. Scholarships will be awarded based on high school grades. For further information on the awards go to: www.canterbury.ac.nz/scholarships

Structure of the degree

The degree is structured as follows:

Year 1

If taken at UC, the subjects will normally be as follows:

BIOL112	Ecology, Evolution and Conservation
FORE111	Trees, Forests and Environment
FORE131	Trees in the Landscape
FORE141	Forest Growth and Measurement
FORE151	Commercial Aspects of Forestry
STAT101	Statistics 101
plus	two 15 point electives at 100 level from any degree schedule

Students interested in enrolling for concurrent degrees should refer to the last section on this page.

Year 2

All students take:

FORE205	Introduction to Forest Engineering
FORE215	Introduction to Forest Economics
FORE218	Forest Biology
FORE219	Introduction to Silviculture
FORE222	Biometry 1A
FORE224	Biometry 1B
SOIL203	Soil Fertility

Year 3

FORE307	Plantation Silviculture
FORE316	Forest Management
FORE327	Wood Science
FORE342	Geospatial Science in Forest Monitoring and Management
and	one further subject from the Option Schedule

Year 4

FORE419	Management Case Study
FORE422	Forest Harvest Planning
FORE447	Environmental Forestry
and	three further subjects from the Option Schedule

Option Schedule

FORE423	Forest Transportation and Road Design
FORE426	Forest Products Marketing and International Trade
FORE435	Forest Finance
FORE436	Forest Tree Breeding
FORE437	Advanced Wood Products Processing
FORE443	Biosecurity Risk Management
or	15 points from another Faculty (available in Years 3 and 4). In Year 3, the points must be taken at 200 or 300-level, in Year 4 the points must be taken at 300-level or higher in consultation with the Head of the School.



A maximum of 30 points from other degrees can be taken across Years 3 and 4.

Students who are invited to do Honours must enrol in FORE414 Dissertation in addition to the seven Year 4 courses.

Other course requirements

In addition to the academic requirements discussed above, there are certain other formal requirements for the BForSc degree.

Practical courses

Each student is required to undertake and complete four practical courses. These practical courses are an integral part of the forestry programme and provide a student with an awareness of practical considerations.

A wide range of skills are covered including use and maintenance of forestry equipment, surveying and mapping techniques, first aid, safety in the mountains, facets of indigenous and plantation forestry, forest conservation, recreation and tourism, and Māoritanga.

Practical work

Students are required to obtain practical work experience in Aotearoa New Zealand or overseas during the summer vacations. The School will assist students seeking such work to find suitable placements in conservation and production forestry. International students should note any work restrictions set by the Department of Immigration which take precedence.

Exchange programmes

School of Forestry | Te Kura Ngahere has links to two formal reciprocal exchange programmes. Students have the opportunity to study at the University of British Columbia in Canada and Virginia Tech and State University in Blacksburg, USA. Students regularly take the opportunity to travel to one of these universities for one semester to gain a broader view of forestry on an international stage.

Concurrent degree programmes

For those students with a desire to combine studies in Forestry with studies in Commerce, Science or Law, a concurrent degree programme is possible.

Under this programme, it is possible for a student to graduate with two degrees in a much shorter time compared to doing the degrees separately.

Students interested in the concurrent degree programme would contact School of Forestry | Te Kura Ngahere for more information.

Spending his childhood in rural Te Araroa, Reihana has spent most of his life pursuing activities in the great outdoors and developing an interest in the land.

'The outdoors soon became a passion of mine and with the promising career opportunities that the Forestry degree posed, it was obvious that forestry was a suitable career option,' he says. 'Previous graduates of the School of Forestry had suggested that the degree at UC was not only enjoyable but also a worthwhile degree to pursue.'

Enrolling with an Emerging Leaders Scholarship, Reihana found UC to be the ideal place to develop towards a career in forest resource management.

'Coming from the North Island, UC has been a refreshing change. It has a positive atmosphere and has been an awesome environment to have been a part of.'

'I have been involved in FORSOC since I began at UC. It's been an awesome way of networking with others in the Forestry degree, but also a great way of meeting others from outside the degree. FORSOC provides fun events throughout the year which are a great way to let off some study stress.'

A bonus to being at UC is being able to keep up his hobbies with the range of outdoor locations close by.

'Outside of study I spend most of my time either hunting, fishing, diving, or exploring what the South Island has to offer,' he says.



Reihana's studies also involve multiple field trips to see real-world examples of the theory taught in lectures, which he says is an important part of building enthusiasm for Forestry Science. He received a UC School of Forestry High Achievers Award for his results in the first year.

'I enjoy its ability to cover a range of topics, giving students a broad understanding of what "Forestry" is all about, and the opportunity to get outside and see real life operations as well as providing summer work opportunities. It also attracts likeminded people with similar interests.'

'Come to UC with an open mind and be willing to take any opportunity that comes your way,' he says. 'Balance your time in the books with your social life and your time at UC will be more enjoyable.'

'It was obvious that forestry was a suitable career option...'

Reihana Fisher

(Ngāti Porou)

Bachelor of Forestry Science (Honours)

Bachelor of Engineering with Honours in Forest Engineering *BE(Hons)*



Forest Engineering is a hybrid of engineering, forestry and management. Forest engineers are unique people who can combine skills in those different areas to care for forests. They are adept at “juggling” – solving problems that arise in competing requirements. It takes people with a deep understanding of the situation and strong technical skills to ensure that sensible decisions are made.

Forest engineers have the technical capabilities to develop and implement harvest plans and trucking and roading systems. They use global position systems (GPS) and geographic information systems (GIS) routinely. They design and manage equipment. They develop new wood products and efficient ways of making them. They do these things economically, and so that the environment is respected.

Forest engineers deal with people: they work with the public, government agencies, contractors, and consultants. They guide their own employees. They steer projects through the requirements for resource consent.

Graduates in Forest Engineering go on to exciting careers in private companies and government. Some work for forest operations, others for contractors or consultants. Some set themselves up in their own consulting or contracting businesses.

Forest engineers have rewarding careers with significant responsibility and exciting challenges. They earn respect in industry through their professionalism, and have the same eligibility for membership in Engineering New Zealand (formerly IPENZ) that their Civil, Mechanical, Electrical, Chemical and Natural Resources Engineering colleagues enjoy. Forest engineers can also become members of the New Zealand Institute of Forestry.

To prepare students, the Forest Engineering degree programme is organised with a common First Year, followed by three years specialising in forest engineering. The programme content is approximately 40% Forestry, 50% Civil Engineering and 10% Math.

Entry

Students usually enter the BE(Hons) degree programme in the First Year after achieving University Entrance with their NCEA/Scholarship grades. All students are expected to have at least 14 credits in NCEA Level 3 Maths or Calculus, 14 credits in NCEA Level 3 Physics and 14 credits in NCEA Level 3 Chemistry. 18 credits are strongly recommended in all subjects.

Structure of the degree

Year 1

The degree follows the pattern set for all Engineering degrees, with a common Engineering first year followed by three years specialising in the Forest Engineering discipline.

First Year

All students take:

ENGR100	Academic Writing Assessment
ENGR101	Foundations of Engineering
EMTH118	Engineering Mathematics 1A
EMTH119	Engineering Mathematics 1B
PHYS101	Engineering Physics A: Mechanics, Waves and Thermal Physics

Students who wish to go on to Forest Engineering in subsequent years, must also take:

CHEM111	Chemical Principles and Processes
ENGR102	Engineering Mechanics and Materials
EMTH171	Mathematical Modelling and Computation
and	at least one 15 point elective course to ensure a workload of not less than 120 points

Second Year

All students take:

EMTH210	Engineering Mathematics 2
ENCN213	Design Studio
ENCN221	Engineering Materials
ENCN231	Solid Mechanics
ENCN253	Soil Mechanics
ENFO204	Forest Measurement
FORE205	Introduction to Forest Engineering
FORE215	Introduction to Forest Economics

Third Year

ENCN353	Geotechnical Engineering
ENCN371	Project and Infrastructure Management
ENNR320	Integrated Catchment Analysis OR
ENCI335	Structural Analyses
FORE316	Forest Management
FORE342	Geospatial Science in Forest Monitoring and Management
FORE422	Forest Harvest Planning

Fourth Year

ENFO410	Forest Engineering Research
FORE423	Forest Transportation and Road Design
plus	sufficient courses from the following elective list for full-time study
FORE426	Forest Products Marketing and International Trade
FORE435	Advanced Forest Economics
FORE443	Biosecurity Risk Management

ENGR403	Introduction to Fire Engineering
ENGR406	Wood and Engineering Wood Products
ENNR423	Sustainable Energy Systems
ENCN415	Pavement Engineering
ENCN452	Advanced Geotechnical Engineering
ENGE412	Rock Mechanics and Engineering
any	15 point 400-level option approved by the Director of Studies

Other course requirements

In addition to the academic requirements discussed above, there are certain other formal requirements for the bachelor's degree in Forest Engineering. Forest Engineering students must

complete an approved course of workshop training prior to enrolling in the Third Year. They must also complete 800 hours of approved practical work, normally in no more than three periods. In addition, Forest Engineering students must submit an approved valid First Aid Certificate.

Exchange programme

Forest Engineering students are eligible for an exciting year of overseas exchange study at either University of British Columbia (UBC), Vancouver, Canada or Virginia Polytechnic and State University (VT), Blacksburg, Virginia.

Wood processing focus

The formal exchange programmes with UBC or VT can be used to facilitate a study stream in Solid Wood Processing. Students approved in that stream take ten courses in wood processing over a year's study at either UBC or VT, normally commencing in the second semester of the Third Year. Courses taken overseas cover all aspects of wood processing, such as sawing technology; adhesives; coatings; glu-lam; furniture manufacture; plant layout; and product development and marketing. While at the host university, only the usual UC fees are paid. The formal exchange precludes the payment of overseas fee differentials.

'Forest Engineering combines my interests perfectly: I love physics, maths, and trees!

I really like the idea of working with nature rather than against it – forests provide so many products and services that managing them well means huge benefits for us and future generations. I decided a degree in Forest Engineering will give me the skills to do just that, especially in New Zealand with our unique and important forestry sector.

UC is the only university that offers Forest Engineering in Australasia, but I would say that UC is a good choice for almost any degree. Christchurch is full of new opportunities for me, and I wanted the new experience of moving away from home. I also liked that UC has a massive range of clubs to get involved in outside of courses.

I got quite enthusiastic at Clubs Day and signed up for lots of clubs, but the ones I have enjoyed most are UCM (University of Canterbury Motorsport, where we build an electric racing car) and CUTC (the Canterbury University Tramping Club).

I'm really enjoying my courses. Since Forest Engineering matches my interests so well, most of what I'm learning has been exciting and thought-provoking. And my lecturers are great; it definitely comes across how passionate they are about their subject.

I've met so many diverse people in clubs, courses, and my hall. At UC I've felt like I have so

many new possibilities both in my degree and outside it.

Forest Engineering is the best of both worlds between Forestry and Engineering. Engineering is a lot of fun because there's so many people to talk to who are learning the same thing as you, and there's all sorts of support with your degree and courses. The School of Forestry is smaller, so you get a sense of community and knowing everybody, including the lecturers and older-years.

My Forestry course is much smaller than my Engineering courses, so I feel involved in the lectures and labs and I've made great friends. I love the content I'm learning; I've always enjoyed maths and physics, but my Forestry course has been my favourite. I had no idea forestry was such a diverse sector, and looking at all the social, political, economic, and biological factors in forests is fascinating.

I think there is a place for everyone in forestry. The two main paths at UC into forestry are Forestry Science and Forest Engineering, and they each have a different mix of subjects and courses that form the degree. I recommend looking into the course descriptions (all the information is available on the UC website) to see what you might enjoy.

It's hard to know what the jobs in forestry are like until I try them, which is why I'm so excited for the summers in my degree. All Engineering degrees include work experience, but my forestry scholarship (Ngā Karahipi Uru Rākau) from the Ministry of Primary Industries connects with companies looking for interns every summer.



I'm looking forward to building up real workplace skills and having an informed direction for my career before the end of my degree.

'I had no idea forestry was such a diverse sector..'

Heather Harper

Studying towards a Bachelor of Engineering with Honours in Forest Engineering

Postgraduate study



Postgraduate study

Thinking beyond bachelor's studies? We offer postgraduate studies at a number of levels, including:

- Postgraduate Diploma in Forestry (PGDipFor)
- Master of Forestry Science (MForSc)
- Doctor of Philosophy (PhD)

Programmes of study are very flexible, designed to cater to students' individual needs. Much of the postgraduate study is tied to the research being pursued in the School.

Postgraduate Diploma in Forestry

Enrolment in the one-year Postgraduate Diploma in Forestry is appropriate for graduates with the following backgrounds:

- Aotearoa New Zealand graduates whose degrees are not in forestry, but who seek employment in the forestry sector
- Graduates in forestry of some years standing who seek updating and retraining
- Recent forestry graduates who wish to develop advanced knowledge but not in the area of research
- Forestry graduates from countries where the forestry degree is less quantitative than in Aotearoa New Zealand but does include suitable science, statistics and commerce papers.

The Postgraduate Diploma consists of courses taken from the Master of Forestry Science schedule, excluding research report and thesis. The Diploma normally takes one year of full-time study, or two years of part-time study. Candidates enrolled in the Postgraduate Diploma in Forestry may, with suitable grades, apply to transfer to the second year of a two-year Master of Forestry Science degree without taking up the Diploma.

Master of Forestry Science

Graduates with a Bachelor's degree in forestry science or in another suitable subject area may apply to register for masterate studies. The relevance and standard of undergraduate studies is taken into account when considering the particular course of study to be followed.

Candidates can complete the degree either by passing courses and presenting a report; passing courses and undertaking a thesis; or by submitting a thesis. The first is geared more to management of resources, the last two to research. The courses and report and thesis topics can be taken in all of the broad areas of forestry. Provided that progress is satisfactory, some thesis candidates may transfer to the doctoral programme after a minimum of six months full-time study, subject to the approval of the Dean of Postgraduate Research | Amo Rangahau.

The courses may be general or highly specialised, according to each student's interests, but will in any case pre-suppose a basic knowledge equivalent to a BForSc(Hons). Two courses can be taken from departments outside the School and might consist for example of a course in agricultural science at Lincoln University and one in business administration from the College of Business and Law | Te Rāngai Umanga me te Ture.

Titles and contents of courses vary from year to year to suit students' needs and interests. For full course information go to www.canterbury.ac.nz/courses.

Examples of courses offered at Diploma and Masters level are:

- Forest Transport
- Forest Harvesting
- Advanced Forest Finance
- Research Methods
- Biosecurity Risk Management
- Strategic Marketing of Forest Products
- Plantation Silviculture
- Forest Management
- Advanced IT Applications in Forestry and Natural Resource Management
- Restoration Ecology
- Wood Quality
- Wood Processing
- Advanced Wood Products Processing
- Modelling for Management (a web-based forestry course)
- Environmental Forestry

Doctor of Philosophy

Doctoral studies are open to graduates with a masters degree, or a bachelor's degree with 1st class honours in suitable subjects.

The minimum period of enrolment for a full-time thesis is 36 months, but it typically takes 3-6 months longer to complete and submit a thesis for examination.

Although the degree is awarded on the basis of the thesis, taking course work related to the thesis topic is encouraged. All candidates are expected to follow a course on research methods, which will be given within the School, normally during the first term after enrolment.

It is possible to enrol in a part-time PhD. Students can be given permission to be away from the School for significant periods to use specialised equipment not available on campus, or for field work.

Staff of the School

Professor and Head

B R Manley, *BForSc(Hons), BBS (Accounting), PhD(Wash), FNZIF*

Professors

E G Mason, *BSc(For), PhD(Cant), FNZIF*

J M (Rien) Visser, *BE(Hons), ME, Dr nat tech(Bodenkultur)*

Associate Professors

C Altaner, *Diplom Holzwirtschaft (Hons), PhD(Hamburg)*

L A Apiolaza, *BForSc(Hons), ForEng(Chile), PhD(Massey)*

D C Evison, *BA, BForSc(Hons), PhD(Wash)*

J A Morgenroth, *BSc, MFC(Toronto), PhD(Cant)*

Senior Lecturers

S M Pawson, *BSc, MAppSc(Hons), PhD(Cant)*

Wide TRUST Senior Lecturer in Timber Engineering and Engineered Wood Products: H T Lim, *BScW, MEng, PhD(UBC)*

Lecturers

S V Wyse, *BSc(Biol), BSc(Hons), PhD(Auckland)*

WIDE Trust Lecturer in Geospatial Technologies: C Xu, *BForSc(Hons), PhD(Cant)*

Director of Studies (Forest Engineering)

J M (Rien) Visser, *BE(Hons), ME, Dr nat tech(Bodenkultur)*

Technicians

D K Clark, *NZCS(Stats), BSc(Massey)*

G Hendriks, *CertHortPractice*

M Holzenkämpfer, *Dr rer nat (Naturstoffchemie) (Georg-August Universität)*

M Sharma, *MSc(Chem)(HP University), PhD(Cant)*

V A Wilton, *BSc, DipSc*

School Coordinator

J C Allen

Clemens Altaner, *Diplom Holzwirtschaft (Hons), PhD(Hamburg)*



A wood scientist with expertise in the chain of wood utilisation, including the variability of wood properties, solid timber processing, wood preservation/modification, manufacturing of wood composites and pulp and paper production. Current research focuses on the molecular and micro-structural origin of the exceptional mechanical properties of wood.

Luis Apiolaza, *BForSc(Hons), ForEng(Chile), PhD (Massey)*



A tree breeder and quantitative geneticist with industry-oriented research experience in Australia, Chile and New Zealand. Research interests include geographic patterns of genetic variability for forest trees, development of economic breeding objectives, simulation and optimisation of breeding strategies, large scale genetic evaluation and genetics of wood properties.

David Evison, *BA, BForSc(Hons), PhD(Wash)*



Graduated from the School of Forestry and worked at Forest Research Institute in Rotorua for 15 years, followed by 12 years in industry, in forestry and financial services. Primary research interest is forest economics.

Hyungsuk (Thomas) Lim



A timber engineer with expertise and research interests in the development of engineered wood products, the structural performance of timber components and structures, and the evaluation of timber building technology. Thomas completed tertiary education in Canada (University of British Columbia,

University of Toronto) and worked as an assistant professor at Mississippi State University, USA

Bruce Manley, *BForSc(Hons), BBS(Accounting), PhD*



A graduate of the School who spent 20 years at the Forest Research Institute in Rotorua as a scientist and science manager working on the development of forestry decision-support systems and using these systems as a consultant to the industry. Research interests include forest management planning, forest estate modelling and forest valuation.

Euan Mason, *BSc(For), PhD*



Trained as a forester in the USA, worked as a forester and then as a scientist in New Zealand's plantations for 13 years, and then spent one year as a researcher at Lincoln University before joining the School. Main research interests are in silviculture, growth and yield modelling, applications of artificial intelligence, and decision-support systems for forest management.

Justin Morgenroth, *BSc, MFC(Toronto), PhD(Canterbury)*



A PhD graduate from the School, Justin's research is focused on applying geospatial data, tools and techniques to solving applied problems. He focuses primarily on forested landscapes (both native and plantation), with a specific interest in urban forests. He works extensively with LiDAR, aerial photography and satellite imagery datasets.

Steve Pawson, *BSc, BPRM, MAppSc(Hons), PhD(Cant)*



Formerly Research Leader Entomology at Scion, Steve joined the School in 2020. He is a forest

entomologist with interests in biodiversity, deadwood ecology and biosecurity/invasive species. He has a particular focus on the interface between biology and new technologies with a focus on multi-disciplinary projects.

Rien Visser, *BE(Hons) ME(Hons), Dr nat tech(Bodenkultur)*



Educated: BE(Hons) at Canterbury, Masters of Engineering at UC Davis, USA and a doctorate in Forest Engineering at Bodenkultur University, Austria. Worked as a researcher and scientist with LIRO and NZ FRI before taking up a faculty position with Virginia Tech, USA. Research interests include harvest system evaluation; biomass harvesting and transport logistics; low-impact and steep terrain harvesting systems; environmental assessment; value recovery and marketing.

Sarah Wyse, *BSc (Biol), BSc(Hons), PhD*



A forest ecologist with research interests in plant regeneration ecology, including responses to disturbance, seed ecology, and seed dispersal. Applied research interests include seed conservation, ecological restoration, and the management of wilding conifers.

Vega (Cong) Xu, *BForSc(Hons), PhD*



A graduate of the School, previously worked as a forest consultant. Research primarily focuses on remote sensing and GIS applications in forestry and natural environment, such as estimating forest biophysical variables, vegetation classification and change detection

All staff have been involved actively in research and development projects in a number of overseas countries. Extensive use is made of teaching staff in other departments.

Adjunct Fellows and Lecturers

Professor Emerita

Roger Sands, *BScFor(Hons), PhD*



Educated at Australian National University, former Director of University Studies at the School of Forestry

at Melbourne University and recently retired as Head of School of NZ School of Forestry. Research interests include tree physiology, soil science, silviculture, agroforestry, site productivity and forest management.

David Norton, *BSc(Hons), PhD*



A plant ecologist. Research interests in conservation biology and management, ecological restoration

and sustainable land management.

Adjunct Senior Fellows

Mark Bloomberg, *BForSc(Hons), MAppSc, PhD(Lincoln)*



Mark joined the School of Forestry in 2008 after completing a Masters and PhD at Lincoln University.

Research interests include site productivity, regeneration ecology, agroforestry and tropical forestry. Before undertaking postgraduate study, he worked in forest management and soil conservation.

Peter Clinton, *BSc, MSc, PhD(Cant)*



A graduate of the School of Forestry, has worked with Forest Research Institute and now Scion/Ensis.

Specialises in soils and tree nutrition.

Nick Ledgard, *QSO, BSc, MSc(Bangor)*



Since joining the Forest Research Institute in 1971, Nick has specialized in the growing of a range of species in New Zealand's farmland environments. This, together with his long and close association with the NZ Farm Forestry Association makes him well suited to teach the School's course on 'Trees in the NZ Landscape'.

UC Restoration Ambassador Research Associate

Adam Forbes, *MSc, PhD (Cant)*



Educated at Massey University, University of Auckland, and recently completed a PhD in Forestry at

University of Canterbury. Currently working as an Ecological Consultant

and Researcher. Adam's interests include forest regeneration beneath exotic forest canopies, restoration of native ecosystems, and biodiversity conservation – especially in lowland production landscapes.

Adjunct Fellow

Juergen Esperschuetz, *Dipl-Ing Agr, PhD (TUM, Germany)*



Juergen has been working in a variety of scientific areas, including rhizosphere dynamics and plant

soil interactions, ecosystem processes, mass spectrometry and stable isotope applications, as well as organic agriculture and soil fertility. His current research focus is around the beneficial use and re-use of biowastes.

The University of Canterbury | Te Whare Wānanga o Waitaha



Ranked in the top one percent of the world's universities*, the University of Canterbury | Te Whare Wānanga o Waitaha offers a stimulating range of courses, a vibrant campus environment with students from around the globe and a great student lifestyle. UC balances the best of university life.

Be one of tomorrow's leaders

UC has been producing leaders for 140 years and has built up an international reputation for its high quality degrees, teaching staff and research. Some of our more well-known graduates include former Prime Minister John Key, Nobel prize-winner Ernest Rutherford, Sir Apriana Ngata – New Zealand's first Māori graduate, former All Blacks rugby coach Sir Graham Henry, children's author Margaret Mahy, television and radio presenter Toni Street, and comedian Rhys Darby.

Learn from the best

At UC, you'll learn from lecturers who write university textbooks, are internationally respected and push the boundaries of knowledge. The University's world-class education is also enhanced by the many outstanding international academics who visit each year on our staff exchange programmes. You may be taught by academic staff from the Universities of Oxford or Cambridge.

Use unique field stations

UC is very strong in field-based sciences. We have the most extensive network of field stations for student and staff research of any university in Aotearoa New Zealand, including stations at Kaikōura, Cass, Westport, the sub-Antarctic Snares Islands and Antarctica, and New Zealand's premier astronomical research facility at Ōtehiwai Mt John, Takapō | Tekapō. In addition we operate a field station in Nigeria as part of the Nigerian Montane Forest Project.

*QS World University Rankings 2018

Taking the next step

If you've decided that studying at the University of Canterbury | Te Whare Wānanga o Waitaha is an option for you, here is what you need to do. Remember, it's never too early to start thinking about what degree to take and what subjects to study.

If you're at school – work hard to make sure you meet UC's entry criteria which makes getting into university so much easier. If you're in Year 11 or Year 12, make good subject choices to give yourself the best opportunities. If you have left school, check that you meet UC's entry criteria.

Research the subjects and degrees available at UC and pick the ones that suit your interests and goals. Seek advice from parents, professionals, lecturers, other students, your careers advisor and classroom teachers and the UC Careers, Internships & Employment team.

Contact Student Liaison | Tu Rōpū Takawaenga or look out for their visits to your region.

Plan your course. Student Liaison | Tu Rōpū Takawaenga can assist you with course planning. Phone 0800 827 748 to make an appointment on campus or to ask for help. There are also regional offices in Tāmaki-makau-rau Auckland and Whanganui-a-Tara Wellington. Or you can fill in an online course planning form at www.canterbury.ac.nz/liaison.

If your programme requires a special application (in addition to the Application to Enrol), request the separate application form from the relevant College or School, or the UC Contact Centre.

Get a Guide to Enrolment from your careers advisor if you are at school or by phoning 0800 Varsity (827 748). The Guide to Enrolment is available from late September.

Contact StudyLink and apply for your Student Allowance and/or Student Loan: freephone in NZ 0800 88 99 00 or to www.studylink.govt.nz. You should do this early in the year.

Consider enrolling in a Science Headstart preparatory course over summer. The Contact Centre can send you a brochure with all the options: freephone in NZ 0800 Varsity (827 748).

How can I find out more?

To find out more about...	Go to this website...
Accommodation	www.canterbury.ac.nz/accommodation
Admission Enrolment Fees	www.canterbury.ac.nz/enrol
Careers	www.canterbury.ac.nz/careers
Courses, subjects, qualifications	www.canterbury.ac.nz/study/qualifications-and-courses
International students at UC	www.canterbury.ac.nz/international
Māori students at UC	www.canterbury.ac.nz/support/akonga-maori
Pacific students at UC	www.canterbury.ac.nz/support/pasifika
Postgraduate and graduate study	www.canterbury.ac.nz/postgraduate
Regulations	www.canterbury.ac.nz/regulations
Headstart preparatory courses	www.canterbury.ac.nz/get-started/transition
Scholarships	www.canterbury.ac.nz/scholarships
Student Liaison	www.canterbury.ac.nz/engage/school-resources/liaison
Student loans and allowances	www.studylink.govt.nz

All University of Canterbury | Te Whare Wānanga Waitaha publications are available in pdf format at www.canterbury.ac.nz/publications

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