

2023



Hands-On at Otago

Whai Wheako i Ōtākou

Business | Health Sciences | Humanities | Sciences

15-20 January 2023

Application information





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Hands-On at Otago

Hands-On at Otago is a programme designed to allow students to experience a week of the Otago student life – living in a residential college, undertaking detailed studies and learning from some of the foremost researchers in the country. The environment is friendly, inclusive, supportive and interactive. Students are encouraged to participate fully in research projects, in a range of other university studies, and in an exciting social and recreational programme. There are opportunities for students to explore career options and to consider new and unfamiliar possibilities for study. Hands-On at Otago brings up to 400 secondary students to New Zealand's first and most attractive university – an institution with an international reputation for excellence in research and teaching.

Hands-On at Otago will be held at the University of Otago, Dunedin, from **15 to 20 January 2023**. To qualify for the programme, students must be entering Year 12 or 13 in 2023. Teachers or principals are required to complete a section on the application form confirming that the student has strong motivation and the potential to excel. Applicants are required to write a page to support their application, which should include any information they feel is relevant and important.

Programme: The Hands-On week

Each morning of the Hands-On at Otago week the students participate in a research project based in a University department. Allocation to these projects is based on student choice. However, for each project we also try to achieve a good balance of skills and backgrounds, while accommodating the specific requirements of individual projects and supervisors. Every attempt is made to satisfy student preferences.

The Science projects give students hands-on experience in a variety of departments with active research applications. Projects are based in the Sciences and Health Sciences divisions, and include: Anatomy, Biochemistry, Computer Science, Engineering, Food Science, Genetics, Geology, Marine Science, Microbiology and Immunology, Nanochemistry, Natural Products Chemistry, Pharmacology and Toxicology, Pharmacy, Physics, Physiology, Psychology, Sports Science and Zoology.

The Humanities projects will give students experience investigating the human world, what it is to be human and how human beings relate to their environment. Humanities covers two main areas of learning: the Arts and the Social Sciences. Projects will be based in many of the leading departments in the country, including: Archaeology; Education; English and Linguistics; Geography; Law; Politics; Sociology, Gender Studies, Criminology and Social Work; and Theatre and Dance.

The Business projects will give students the chance to develop their digital crime-fighting, communication and creativity skills in projects based in innovative and exciting departments: Economics, Information Science, International Business and Marketing.

The **taster** programme allows students to have a small taste of a variety of other activities, both on and off campus, during the afternoon. These tasters provide an excellent opportunity for students to see the exciting diversity of courses and programmes available at the University of Otago, and to experience applications of research and techniques in the real world. Students will be allocated three tasters from different areas to broaden the range of experience offered.

Opportunities for students to talk with University of Otago advisers and liaison officers about course options and prerequisites will be arranged during the week. A tour of student accommodation will also be available for students who are about to enter Year 13. Applicants are asked to indicate on the application form if they would like to participate in any of these tours.

Registration happens as you arrive. For students arriving by car, we recommend you arrive by 2pm on Sunday 15 January. This is followed at 3:30pm by an orientation programme, a mihi whakatau and an introductory session in the evening, and then an "Amazing Race". The programme will close on Friday 20 January with a plenary session followed by lunch, finishing at approximately 2pm.

Cost

The programme fee for Hands-On at Otago is **\$675**, which covers accommodation, meals and programme activities. Once accepted, payment of this fee is required within one month to secure your place.

Hands-On at Otago is fully residential. Full board for all participants is provided at Arana College and Studholme College, from Sunday 15 January until the afternoon of Friday 20 January. Both are comfortable residential colleges adjacent to the University. Board covers breakfast, lunch and dinner, and includes single bedroom accommodation with shared bathroom facilities. Bed linen and towels are provided. For further information about Arana and Studholme, please visit their websites:

otago.ac.nz/arana

otago.ac.nz/studholme

If necessary, accommodation can be extended to include the Saturday night before (14 January) or the Friday night (20 January) at an additional cost of \$80 per night. Please contact us for further details.

The formal programme will be balanced by a variety of social and recreational activities in the afternoons and evenings. Experienced adult supervision will be provided for students at all times during the course of the Hands-On at Otago programme.

Application

Applications are made online:
otago.ac.nz/hands-on-at-otago

**The closing date for applications is
Thursday 8 September 2022.**

Supporting information

Students need to include a submission to strengthen their application for Hands-On at Otago. This should be at least a page long (but no more than two pages) and should cover: current and previous NCEA or other school qualifications, any extracurricular school-based achievements and involvement (e.g. Science Fair, Hillary Award, MUNA, Brain Bee, Stage Challenge, sports teams, etc.), community-based achievements and involvement (e.g. St John volunteer, Scouts/Guides, music, sports clubs, dance, etc.) and a personal statement indicating why they should be selected to attend Hands-On at Otago 2023. These will be read and assessed by members of the organising committee.

Please do not send school reports or NCEA Records of Achievement.

In order to maintain the high quality of the Hands-On at Otago experience, numbers are restricted to 400 participants.

A letter will be sent to all students by mid-November advising whether or not they have been selected for Hands-On at Otago 2023, and indicating their project allocation. Included in this mailing will be details of the final programme, contact telephone numbers, a travel form to be completed and returned, and instructions on how to pay.

Sponsorship, awards and scholarships

Sponsorship

Many students who attend Hands-On at Otago are able to obtain either full or partial sponsorship. If students require financial assistance, we suggest they contact one of their local service groups (such as Rotary) or their school Board of Trustees. School teachers or principals may be able to provide assistance in approaching these groups.

Awards

Mana Pounamu awards

Mana Pounamu awards are funded by the University of Otago and administered by the Mana Pounamu Committee. The recipients of these awards are selected from the Mana Pounamu Award winners of that year. The Mana Pounamu awards are offered to students of Māori descent attending secondary schools in the Otago region. These are fully-funded awards that cover programme fee, accommodation, meals and programme activities for the week.

Scholarships

To apply for a scholarship, students need to complete a scholarship application online:

otago.ac.nz/hands-on-at-otago

There is one application form for all scholarships – remember to select the scholarship that you are applying for at the top of the form. Each scholarship requires a written essay and the criteria for each essay is different – read the criteria carefully.

The closing date for all scholarship applications is Thursday 8 September 2022.

Sciences Hands-On Scholarship

Hands-On at Otago scholarships are offered to students who have selected science projects in their application and are looking to pursue further study within the Sciences. There are six scholarships available and they cover the registration and travel costs to a maximum of \$1,300 each to Hands-On at Otago 2023. These scholarships offer students who are entering Year 12 or 13 in 2023, an opportunity to participate in the Hands-On programme, while experiencing one of our exciting science projects. The aim of the scholarships is to inspire and motivate those who have a passion for learning and wish to develop their knowledge and skills alongside many other students who share their interests.

Imagine Beyond Scholarship

These are fully-funded scholarships, made available by the University of Otago Disability Information and Support Office, for students who are Deaf or who have a disability or impairment. Each scholarship covers programme fee, travel, accommodation, meals and programme activities for the week. The student needs to explain why they feel they deserve the grant, and give an indication of the benefits they expect to gain from participation in Hands-On at Otago. A letter of recommendation from their supporting teacher should also be included.

Poutama Scholarship

These are fully-funded scholarships for students of Māori descent entering Year 12 or 13 in 2023. The Poutama scholarships are funded by the University of Otago. The aim of the scholarship is to inspire and support rangatahi Māori to develop their knowledge, skills and passion for tertiary studies. Each scholarship covers the programme fee, travel, accommodation, meals and programme activities for the week.

Pacific Islands Scholarship

These are fully-funded scholarships for students of Pacific Nations descent entering Year 12 or 13 in 2023. The Pacific Islands Scholarships are administered by the Pacific Islands Centre at the University of Otago. Each scholarship covers the programme fee, travel, accommodation, meals and programme activities for the week.

Humanities Shakespeare Festival Scholarship

These are fully-funded scholarships for students who participated in either the regional and/or national Shakespeare festivals in 2022 and who wish to take Humanities projects. The Humanities Shakespeare Festival Scholarships are funded by the Division of Humanities at the University of Otago. Each scholarship covers the programme fee, travel, accommodation, meals and programme activities for the week.

The Business Hands-On Scholarship

Otago Business School offers scholarships that cover the full registration cost plus travel to and from Hands-On at Otago 2023 (up to a maximum total value of \$1,500). This scholarship will be offered to those who have selected business projects in their application and are looking to pursue further study in business. The business projects offered at Hands-On 2023 are Marketing, Economics, Information Science and International Business.

International Scholarship

The International Office at the University of Otago offers the International Hands-On at Otago scholarships. These are fully funded scholarships that provide a fantastic opportunity for international students currently studying at a New Zealand secondary school, entering Year 12 or 13 in 2023, to participate in the Hands-On at Otago programme. Each scholarship covers travel, accommodation, meals and programme activities for the week.

Dodd-Walls Scholarship

The Dodd-Walls Centre offers scholarships covering fees and travel to support Māori and Pasifika students who wish to attend Hands-On at Otago. Special consideration is given to students from Māngere College and students from schools that are associated with the Science Wānanga programme. Scholarship recipients must be interested in studying science and will complete STEM modules during Hands-On.

Taranaki Student Scholarship

This is a fully-funded scholarship to help one Taranaki secondary student attend the programme in 2023. The successful recipient will have the whole experience paid for, including flights and the application fee, which includes food and accommodation.

More information about each of the scholarships is available at:

otago.ac.nz/hands-on-at-otago/cost/otago690299

Special requirements

Students who are Deaf or who have a disability¹

Students who are Deaf or have a disability or impairment are encouraged to attend Hands-On at Otago. Assistance is available, including sign language interpreting support, note-takers and laboratory assistants. All Hands-On at Otago participants are expected to live in for the week, but assistance can be organised for those who require it. Students requiring any form of assistance need to notify us by Friday 15 October about their particular requirements so that we can endeavour to assist them. The University of Otago Disability Information and Support Office can be contacted directly on 03 479 8235.

Special clothing requirements and ethical approval

For some projects, it will be necessary for parents or guardians to give consent for participation by the student. If this is required, the appropriate form will be sent together with the acceptance letter. Many projects are carried out in a laboratory environment. While specialised safety equipment will be provided (e.g. lab coats, gloves and eye protection), it is part of the Health and Safety regulations at the University of Otago that students wear a pair of closed-toe shoes, such as trainers, in laboratories. Some projects also include activities such as tramping or bush-walking. In this case a pair of sturdy shoes or boots is an absolute requirement for participation.

¹ Disability includes mental health conditions, specific learning disabilities, medical conditions, chronic illness, and visual, hearing and mobility impairments.

Travel arrangements

All students (including those from Dunedin) are required to complete a travel form outlining their arrival and departure details. This form will be sent to students together with the acceptance letter.

Hands-On at Otago starts with registration from 10am on Sunday and finishes after lunch at 2pm on Friday. Family members who are travelling to collect students on Friday are cordially invited to join us earlier for the plenary report back session from 9:30am.

Orbit Travel in Dunedin is offering to arrange air travel bookings for students from all centres. For fare and flight details please contact Megan Murch:

0800 322 747; 03 467 7457 or email mmurch@orbit.co.nz

The benefit of this is that Orbit Travel will book a flight when the student applies for Hands-On at Otago, but the flight will be confirmed and billed only once the student has been accepted in November. This allows the students to get the best possible price for their bookings, with no risk of being left with an unwanted booking on their hands. If you would like to take advantage of this offer, please fill in the optional Orbit Travel Flight Booking form which is part of the application form.

Once you have been accepted for Hands-On at Otago 2023, Orbit Travel will contact you with flight details and costs. Please note that payment will be required at that time in order to confirm your booking. Travel insurance is available to cover cancellations due to unforeseen circumstances.

When making homeward flight bookings please ensure that a minimum of one hour is allowed for travel to the airport from Dunedin city. As the programme finishes at lunchtime, flight bookings should be made for afternoon or evening flights.

All participants travelling by bus or plane will be met when and where they arrive in Dunedin, and after the camp they will be taken to the bus station or airport to connect with their homeward transport.

Withdrawals

If students are not satisfied with their allocated project they may withdraw without penalty before 2 December 2022.

If cancellations are received between 3 December 2022 and 1 January 2023, a 50 per cent refund will be made. After 1 January 2023, we reserve the right to retain the full course fee.

The University of Otago also reserves the right to alter components of the programme, to cancel or terminate the programme, or to reject an application.

In the event that the Hands-On at Otago has to be cancelled or changed due to events beyond the University of Otago's control, the University of Otago will not be held liable to attendees for any damages, losses or costs incurred, including but not limited to transportation costs. If, under the circumstances described above, the event does need to be cancelled, event fees will either be fully refunded or partially refunded after the deduction of expenses already incurred.

Further information

If you require any further information please contact:

Hands-On at Otago
University of Otago
PO Box 56
Dunedin 9054
Email hands-on@otago.ac.nz
otago.ac.nz/hands-on-at-otago
Tel 03 479 8018 or 03 479 4875

Planning committee

The members of the planning committee for Hands-On at Otago are:

Lisa Russell (Convenor & Zoology); Prajesh Chhanabhai (Convenor & Schools' Liaison); Jasmine Millar and Kathryn Temple (Events); Monique Wright and Ben Anngow (Marketing); Greg Heller and Rhonda Brodie (Schools' Liaison); Andrea Jones (Communications); Wendy Adam (Division of Humanities); Cara Duffy (Division of Sciences); Michelle De Bono (Division of Commerce); Rewa Pene, Greg Walker (Division of Health Sciences); Anne Ford (Archaeology); Rob Hamlin (School of Business) Celia Lie (Science); Tama Walker (Māori Centre), Jason Palmer, Jessica McIntyre, Rachel Heller and Yvonne Mitchell (Camp Management).

2023 Projects

Anatomy

From mortuary to microscope

Discover the beauty of human anatomy and find out how it all works. In this project, you will focus on anatomical structure as seen with the naked eye (macroscopic), right down to things only visible with the electron microscope. By exploring human anatomy you will start to understand how and why structure affects function. You will examine the many dimensions of the knee, experience dissection (of a deer knee joint), work in a histology lab, learn how to drive a microscope and pick up many other valuable skills along the way. Come and join us.

Archaeology

Puzzles of the past

Join our team of archaeologists to travel through time and explore New Zealand's human past. This project will introduce you to the range of tools that we use to unlock the secrets of the past. Work in our archaeological laboratories using state-of-the-art equipment to analyse archaeological artefacts and assemblages. Learn how to make your own stone tools and how to identify different faunal remains from archaeological sites. Visit the Otago Museum to have an insider's look at their archaeological collections. Finally, come on a field trip where we learn how to identify and record real archaeological sites.

Biochemistry

Genius genes and amazing enzymes

If you have ever wondered how living things work, where they get their energy, how they make the components they need or what your genes do, then Biochemistry is for you. In this project we will take a hands-on look at how life works. We will be exploring how genes make proteins, how we can manipulate plants to produce what we want and how our own bodies respond to food.

Biochemistry helps us to understand life and can help make advances in areas such as human medicine and disease treatment, plant and crop technology, and animal health and conservation.

Computer Science

Creating computer games

An introduction to computer programming via the Greenfoot programming environment. Make your own computer game, create a simulation, or do something completely different. If you're new to computer programming, this will be an excellent introduction. If you already have some programming experience, there's plenty of scope to stretch your skills.

Economics

Wonders of human decision behaviour

Are you fascinated by the complexities of human choices? Do you want to know why some humans gamble and at the same time take insurances? Why are we sometimes impatient, but at the same time we procrastinate dirty tasks? When do humans co-operate with or trust others, even when they interact in complete anonymity? Why do humans give to charity?

In this project (possibly coming from a New Zealand governmental research group) you will be both experimenter and participant when we jointly explore the wonders of human decision behaviour and its impact on social outcomes and public policy.

Education

One to many, one to one, one to me

Education is founded on relationships: teacher to student, student to student, and student to self. In education, we cover the range of curriculum areas in *The New Zealand Curriculum*. Teacher's design, develop, and implement programmes to foster life-long and future-focused learning.

In Hands-on Education/ Mātauranga ā-ringā, you will explore various curriculum areas: the technology of chocolate moulds; hauora though physical education; hands-on science of the material world, physical world, living world and planet Earth and beyond; and history from local to national through social sciences.

Who knew learning could be such fun? We did!

Engineering

Designing resilient communities through engineering and surveying

In Aotearoa New Zealand, we live in a dynamic island nation that provides for its current and future generations by designing resilient communities. This is accomplished by making sure our communities can withstand both natural hazards and the ever-increasing impacts of climate change.

Engineers and surveyors play pivotal roles in the design and construction of infrastructure, such as streets, footpaths, and water, wastewater and stormwater networks, that support our communities.

This project gives a taste of some of the challenges that engineers and surveyors face when designing resilient communities. Using a combination of field and laboratory approaches, we'll complete an initial site survey and then design some of the key infrastructures for a proposed new development. We'll then return to the site and use state-of-the-art surveying instruments to bring our design to life by showing its location on the ground surface.

Join us for a hands-on experience using surveying and engineering techniques and instruments to carry out topographic surveys and create digital models of the Earth's surface – and discover how much of a difference you can make in engineering safe living environments.

English and Linguistics

Unlocking the secrets of the past in medieval manuscripts

The medieval world dates roughly between 500 CE and 1500 CE – about 1,000 years. It's a long period, and a time of astonishing change, drama and turmoil. By now, you might be thinking about knights in shining armour, damsels in distress and dragons breathing fire. And we have all that! But there is so much more ...

We are incredibly lucky here at Otago, because Dunedin is home to one of the largest collections of medieval manuscripts in the southern hemisphere – some of the manuscripts are 1,000 years old! In this project, you're going to get to use real medieval manuscripts, learn how to write like a medieval scribe, learn how books were made and learn how to read ancient languages.

Some of our medieval manuscripts have never been researched – some have even mysteriously gone missing – so you will get to unlock their secrets for the first time! By the end of the week, you'll have produced your own manuscript to take home, and written just like a medieval scribe would have – even using real gold to produce illuminations!

Food Science

Awaken your senses

Delve into food science and discover what is behind the aroma, texture and taste of some of your favourite foods.

In this project, you'll enter a product development challenge to make your own ice cream sundae. Learn about the physical and chemical properties of food and the factors that influence the sensory attributes of food and consumers' perceptions.

In our specialised sensory science laboratory, you'll learn how scientific methods are used to measure peoples' sensory perceptions of food quality and acceptance. You'll also get to eat the product of your labours, so come along to get a taste of Food Science.

Genetics

The project will have three main threads, all related to modern genetics:

- A simple gene cloning experiment.
- Crime-solving using DNA analysis.
- The analysis of fruit fly mutations.

Students will also learn about ethics surrounding genetics, and about the interesting research their fantastic demonstrators carry out.

Geography

Zooming in from space to understand urban climates

Land cover is an important control on local climate, as it influences the interactions between the Earth's surface and atmosphere. Changing land cover associated with changes in land use can, therefore, substantially modify local climates.

This is well demonstrated by the urban heat island (UHI) effect, whereby surface and air temperatures of urban areas are frequently higher than neighbouring rural areas.

This project will combine several techniques in order to understand the impacts of urban development on climate across the greater Dunedin landscape. By combining point-based instrumental observations with satellite data that allows surface temperatures to be mapped across the Earth's surface, we will explore the variability in temperature regimes across urban and rural landscapes and how this relates to different land use and land cover.

The project will involve both field work and computer-based analysis, and will provide insights into how urban design and land use decisions can impact local climates and provide mitigations against heat stress associated with climate change.

Geology

Picture the past, forecast the future

The Earth system has experienced dramatic changes over its 4.6-billion-year history. Understanding the causes of these changes, and their effect on past climate, geography and life, allows us to predict the impact of events happening on our planet today.

This project will introduce you to a range of tools that geologists use to understand Earth's past and plan for the future. We will spend time both in the field and in the lab exploring local evidence of volcanic eruptions, earthquakes, climate change and evolution.

Dive into deep time with us and gain a new perspective on the world around you.

Immunology

The epic battle within

On the surface, all appears tranquil and calm; inside, your immune system is waging a constant war against infectious organisms that have found their way into or onto your body. Your immune army includes innate cells whose weaponry allows them to engulf and destroy disease-causing invaders such as viruses, bacteria and fungi. Another branch of your own personal defence force includes the adaptive cells that produce highly specific molecules that target and kill these insidious infectious attackers. You will use a combination of advanced immunological techniques (think microscopes, lasers and glow-in-the-dark materials) to visualise innate and adaptive immune cells in action as they fight potentially deadly bacteria.

Information Science

Digital crime-fighting

Computer crime is on the rise. With viruses, worms, botnets, scammers, packet sniffers and password-crackers, it's a dangerous world out there.

In this project, you'll look at some of the tools and techniques to safeguard against these threats, and use them to gather evidence in a computer crime scene investigation.

International Business

Going global – creating an international mindset for business

International business is everywhere. Technology is enabling globalisation so that markets feel closer than ever before. Negotiating, troubleshooting, making sales and working with people from different cultures is the norm in today's world of work. Being global in business requires thinking about the dynamics of crossing borders with people, products and services. In this project, you will engage in the thinking of managers and consultants by creating a business plan for a small New Zealand company trying to take their product global. No business experience or specific prior knowledge is required, just an open, curious mind.

Law

See how the law works in practice – follow a criminal offence from arrest through to sentencing. Sit in court (COVID protocols allowing) and watch the real thing, then discuss with a lawyer and have all your questions answered. Discover the breadth of the law and its many impacts on us all, and where law could take you. Learn how to think like a lawyer, learn how to cross examine a witness, then try out your new skills in a mock trial. A great way to get a real feel for the law.

Marine Science

Taonga as environmental keystones

Did you know marine science holds the answer to many of the big questions in life? Keystone species are a long-term debated concept, and here in Aotearoa New Zealand our taonga moana have solved the dilemmas of survival a long time ago.

With the perfect salty blend of clean lab work and muddy field trips, we'll take you through some of the biggest obstacles you might come across in life and explore how our taonga species have solved them.

From microscopic to gigantic, marine life continues to inspire and we know for certain it will (fish)hook you into the depths of our oceans!

Marketing

The art of creating value

Most people only ever see a small part of the fascinating process that is marketing – usually just the adverts and the products themselves. Marketing is so much more than this. Marketers are “value capturers”. They have to find out what people want, and what they are prepared to pay for. This is harder than it seems, as very often people don't always know that themselves, especially the “how much” bit! In order to find value, a marketer has to evaluate human pleasure – and pain. From this knowledge of human desires, needs and fears they create a solution that is better than any other. Then they bring that solution into existence and deliver it to those who need it and will value it. It's a fast moving and unpredictable process in which success and failure can be separated from one another by the finest of degrees – one little thing overlooked, one small mistake ...

In this project we conduct three highly applied exercises that will put you through your paces in this environment. Can you design a new product from scratch to address a specific consumer need? Can you look at a non-productive asset and turn it into a product that will generate revenue? Can take product that is failing and turn it into one that will succeed, just changing the way that it is presented? These capabilities, more than anything else, determine marketing success and failure. We show you how to tackle all three of them in a hands-on and collaborative environment.

Microbiology

What can't be seen matters!

Microorganisms are vital for everyday life, from the production of food to the generation of oxygen. In this project, you will examine the unseen microorganisms living in and on your body. You will get to grow and identify some of the bacteria that live in your mouth and on your skin through a range of microbiological techniques, and to participate in an investigative journey to detect the culprit that contaminates food. Included will be a tour of the department where you can meet scientists exploring the different aspects of microbiology, including finding out what makes bacteria and viruses tick, as well as how we fight off infection by microorganisms.

Music

Music production – from nothing to something

How is the music we listen to created? What are the people who make it thinking about? What is it like to perform, record and mix music in a state-of-the-art studio? Students taking part in this project will work together to produce a recording of a popular song, as chosen by the group. Students will learn about recording, performing in the recording studio and mixing techniques, all while working in the University's new recording studio complex, assisted by expert staff. This project is well suited to musicians, however no prior musical knowledge is required.

Nanochemistry

One of the fascinating parts of chemistry is designing and synthesising new molecules or modifying molecules to do specific tasks. Nano is the world of the very small (less than 100 nm, 1 nm is 1×10^{-9} m). In this project you will be investigating some of the properties of nanoscale materials. The project varies from year to year so you may be creating silver nanoparticles to explore their interaction with light or synthesising super hydrophobic silica nanoparticles to create waterproof coatings. The work will introduce you to some of the skills used by synthetic chemists in their research as well as how the properties of materials change when you get down to the nanometer scale.

Natural products chemistry

The isolation and study of new chemical compounds from diverse sources, such as plants, animals and bacteria, is a hugely important area of chemical research because such studies can lead to the discovery of new medicines. Three stages are involved: isolation of the compound, analysis of its molecular structure and chemical properties, and then synthesis of the compound in the lab. In this project, we will use caffeine as a case study to explore these three stages. You will isolate caffeine from various natural and unnatural sources, such as coffee and energy drinks, and also synthesise it from various starting materials. You will then analyse your products using the chemistry department's state-of-the-art instruments.

Pharmacology and Toxicology

Investigating the future of drugs and the impact of chemicals on the environment

Pharmacology is all about how drugs work, what they do and why they do it. Pharmacologists study diseases and how we can use drugs to treat them, while toxicologists are involved in studying everything from cancer to environmental toxins. During this module, you will get to experience what it's like to be a pharmacologist. We'll learn about "whether caffeine can actually make you smarter" and also perform some "drug discovery" by investigating the anti-cancer properties of plants in our environment. We'll finish off the week by testing your investigation skills as an environmental toxicologist. You will determine what is polluting our waters and assess whether these could have toxic effects on the species living in them.

Pharmacy

Medicines and the pharmacist

Pharmacists are qualified to dispense prescription medications and give advice on over-the-counter medicines. They're also involved in almost every stage of the development and supply of medicines. Pharmacists are employed in industry as research scientists; others are involved in the quality control of drugs or drug information.

Pharmacists are also pivotal in running clinical trials of potential drugs to evaluate their effectiveness and whether they are suitable to be used in the treatment of human or animal conditions.

Hospital and community pharmacists advise other health professionals and patients on the best use of drugs, as well as being involved in the dispensing and sometimes manufacture of medicines.

This project includes an introduction to the role of the pharmacist and will cover as many aspects of pharmacy as possible: dispensing, formulation, quality control of medicines, and the pharmacist patient-care process. You will have the opportunity to manufacture various creams and medicines, and then analyse the quality of the medicines you make.

Physics

Space and the atmosphere

Have you ever looked up at the night sky and wondered what is happening in the darkness? Join us as we discover how the sun can influence activity in the atmosphere and ways we can measure this from the ground.

In this project, you'll also get to build your own radio antenna and take it for a test run in some beautiful Dunedin scenery.

Physiology

Body works

You'll carry out experiments to learn about your nerves and muscles, measure your sensitivity to touch, discover your blind spot, examine your hearing and have fun with your sense of balance.

You'll explore your perception of flavour and why you block your nose to eat something you don't like!

You'll measure your blood pressure and examine how your heart copes with exercise.

You'll see that Physiology is all about understanding how your body works!

Politics

Calling all crisis negotiators!

Ever imagined being at the table where all the decisions are made? Where you negotiate, confront, and solve some of the most complex environmental, humanitarian and diplomatic issues facing the world today? Now you can be at that (simulated) table.

Over the week with Politics, you will be at the centre of political decision-making, taking on the responsibilities of politicians, policy advisors and representatives. We will then take a truly "hands-on" approach at Dunedin's own Quarantine Island, putting our ideas into practice in a local and unique historical setting.

Psychology

The science of behaviour

You will be both experimenter and participant as we introduce you to intriguing aspects of human behaviour. What specialties do different parts of the brain have? Why do we behave differently in different settings? Are our memories of events as accurate as we like to believe they are?

You will explore issues like these while learning how scientific research is conducted in psychology and how to design your own experiments. You will also tour the department and meet scientists and clinicians working in different areas of psychology.

Sociology, Gender Studies, Criminology and Social Work

Discover the extraordinary in the ordinary

Work with us to look at the ordinary world around us through new and different lenses. Throughout the week we'll re-visit common locations looking at them through new eyes. Each perspective asks different questions and sheds light on new areas:

Sociology: How does social inequality impact on daily life? How can we change the world?

Gender: How did gender happen to you? How does gender shape the world around us?

Criminology: What is crime? What is punishment? How have they changed over time, and why?

Social Work: Are there human rights issues here? How can we support those around us?

Sport and Exercise Science

Enhancing knowledge and understanding of human movement

How is physical performance measured and sports technique evaluated? How can we improve performance and reduce the risk of injury? How does our body respond to meet the energetic and physiological demands for exercise performance, and how are these demands affected by factors such as environmental temperature or humidity? Students will take a hands-on approach while experiencing leading-edge technology, including the aquatics and environmental research facility used in studying human performance.

Theatre and Dance

Be a creative and imaginative performer

Join us for a week of fun, creativity and learning as you undertake daily workshops in a vibrant and supportive environment, in theatre and dance. Highly skilled and enthusiastic theatre and dance professionals will teach you a variety of technical and artistic skills in these distinct disciplines and will inspire you to discover your inner performer.

Each morning, you will have one session in theatre and one in dance, where you will develop solo and group works and explore different modes of expression, creative processes and the art of rehearsing. The theatre session will include devising a short theatrical script from material generated through improvisational techniques in a playful and sophisticated manner. In the dance session, you will expand your artistic and aesthetic skills and learn how to compose an original contemporary dance choreography. The week's programme will give you a glimpse of being in the spotlight as it will culminate in a showcase performance in front of other Hands-On students.

Zoology

Join us for a unique opportunity to experience some of New Zealand's greatest treasures – our animals. This project offers a field trip, hands-on lab work such as dissections and skull identifications, and opportunities to get up close and personal with native animals in the lab, in the wild and in the museum. As the field trip may include sites that are not easily accessible, you will require a moderate level of fitness, sturdy footwear and warm clothes.



Canon

Experience a week of Science, Humanities,
Business and Health Science activities for
students in Year 12 or 13 in 2023

Organised by the Hands-On at Otago Planning Committee
University of Otago