

Mātai Matū

Undergraduate Chemistry

Chemistry is the science of atoms and molecules. If you want to understand the structure and properties of the world around you, then Chemistry is the science for you. It's a central science, and underpins fields as diverse as biology, geology, environmental science, medicine and engineering.

What you will learn

The University of Auckland is New Zealand's leading University¹, and studying Chemistry with us means you'll have access to award-winning laboratory facilities, and academics who are leaders in their field.

Chemistry deals with molecular structure and synthesis, chemical reactions and theoretical models that explain molecular behaviour. The study of Chemistry leads to new substances, better processing reactions and greater understanding of materials, biological processing and the environment.

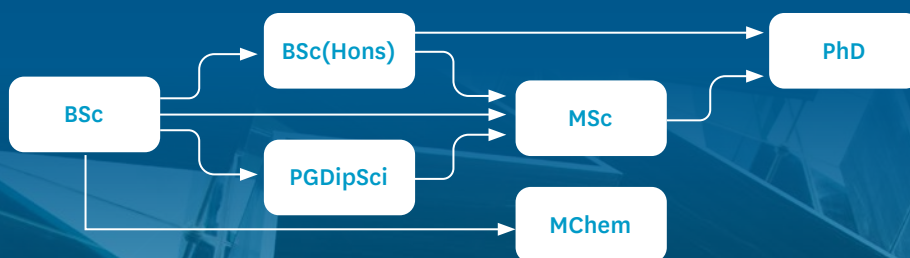
If you'd like to study Chemistry with us, it would be beneficial to have studied chemistry at high school. Mathematics and physics also provide helpful numerical knowledge, but they're not essential.

Choosing a subject

With so many options it's sometimes hard to choose what you want to study, but we've got you covered. You can study a double major with our Bachelor of Science to gain a broader base of skills and knowledge.

Complementary majors include:

- Anthropological Science
- Biological Sciences
- Earth Sciences
- Environmental Science
- Geography
- Mathematics



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¹QS World University Rankings 2024

Career opportunities

A career with wide-ranging opportunities

Chemistry is an extraordinarily multi-disciplinary science. The interaction with other sciences has an enormous influence on our modern lifestyle and standard of living.

Studying Chemistry leads to new substances, better processing reactions and greater understanding of materials, biological processing and the environment.

Future opportunities for Chemistry graduates are many and varied. You may offer future employers an ability to think logically, analyse complex systems and communicate clearly.

You may end up working in the fields of food, paper, brewing, paint and plastics, ceramics, metals and agricultural products. You could also work in a Crown Research Institute, medical and diagnostic or Government laboratories, and police forensic units.

Our Chemistry graduates have gone on to careers like these::

- Postdoctoral Research fellow, Harvard University
- Teacher, Aorere College
- Business Development Director, My Green Lab
- Laboratory assistant, AsureQuality
- Assistant Professor, NTU Singapore
- Patent Attorney, Germany
- Project engineer, Woodside Energy
- Teacher, Macleans College
- Senior Scientist, NPL, UK

What you can study:

Chemistry of the living and material worlds

Spectroscopy

Properties of matter

Nano-materials

Organic chemistry

Molecular synthesis

Modelling chemical processes

Green chemistry

Biomolecular chemistry

Materials chemistry

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-chemistry



“What I love about studying Chemistry is the strong connection of both the scientific practice, inquiry, and learning, as well as discovering the art of the field both in and out of the theoretical and practical learning environments. As a lover of challenges and puzzles, Chemistry and Psychology enables me to be as creative as possible to formulate ideas in an attainable way guided by awesome academic staff, postgraduate students, and peers. There is always something to keep you on your toes.”

“Coming from Christchurch, the University of Auckland Top Achiever Scholarship for 2019 has enabled me to form important and cherished friendships and memories at the University Halls of Residence.”

Eugene In

BSc in Chemistry and Psychology



Read Eugene's full story at: auckland.ac.nz/science/eugene-in

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Mātai Taiao Ahupūngao

Undergraduate Environmental Physics

Environmental Physics is a study that uses physics to understand the Earth's processes from deep inside the planet, to its oceans and atmosphere. With this knowledge, environmental physicists understand the Earth's past and present, and model our future environment.

What you will learn

As an environmental physics student, you'll study the physical processes of the Earth, including the hazards posed by earthquakes and volcanoes, the currents in oceans and atmosphere, weather, and climate.

Environmental physics brings together a deep understanding of all the physical properties at work on our planet.

Studying environmental physics at the University of Auckland means you'll learn in an environment that is ranked first in New Zealand.

Prerequisites

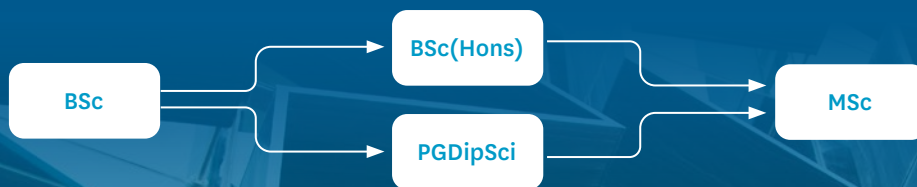
If you're interested in studying Environmental Physics with us, you will need to have taken physics and mathematics at high school. Geography, chemistry and statistics provide helpful background knowledge, but they're not essential.

Choosing a subject

With so many options it's sometimes hard to choose what you want to study, but we've got you covered. You can study a double major with our Bachelor of Science to gain a broader base of skills and knowledge.

Complementary majors include:

- Computer Science
- Earth Sciences
- Environment Science
- Geography
- Mathematics
- Physics



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Career opportunities

A workforce addressing the future

Important questions about the future of climate, energy, geohazards, and drinking water require a workforce that is well-versed in the different aspects of Environmental Physics.

As an Environmental Physics graduate, you are trained in a variety of disciplines during your studies. These include mathematical modelling, statistics, physics and computer science, and can lead to a variety of career paths.

Our graduates can be found researching the geophysical processes involved with climate, plate tectonics, earthquakes, volcanoes, the oceans and our atmosphere.

You can become an important part of a new Green and sustainable world, looking for solutions in sustainable energy and resource management.

Jobs for our Environmental Physics graduates include:

- Atmospheric scientist
- Energy industry consultant
- Geohazard researcher
- Ground and geothermal water exploration consultant
- Environmental and geotechnical specialist
- Mineral industry advisor
- Oceanographer

What you can study:

Climate

Structure and dynamics of the Earth

Natural hazards and resources

Oceans and atmosphere

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-environmental-physics

“I chose to take on two majors because my interests were so vast, I didn’t know what to pick! I am pleased I did. The two majors are so intertwined - analysing the Earth’s subsurface and surface processes using different tools and perspectives. “There is still so much unknown about the Earth’s processes, and this knowledge gap ignites my curiosity and passion that has motivated me to pursue postgraduate qualifications.”

Meegan Soulsby

BSc Environmental Physics



Read Meegan’s full story at:
auckland.ac.nz/science/meegan-soulsby



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Mātai Pūtaiao Kai me Taioranga Kai

Undergraduate Food Science and Nutrition

There is a wealth of science behind the food we eat, how it's made, and how it affects our health. This science is part of a fascinating subject that is highly relevant to the lives of everyone.

What you will learn

Food Science and Nutrition is the science behind the food we eat. From the effect food has on our behaviour and wellbeing, to new applications in food development, processing, compliance and food safety.

When studying this subject at the University of Auckland, you choose between two distinct pathways: Food Science or Nutrition.

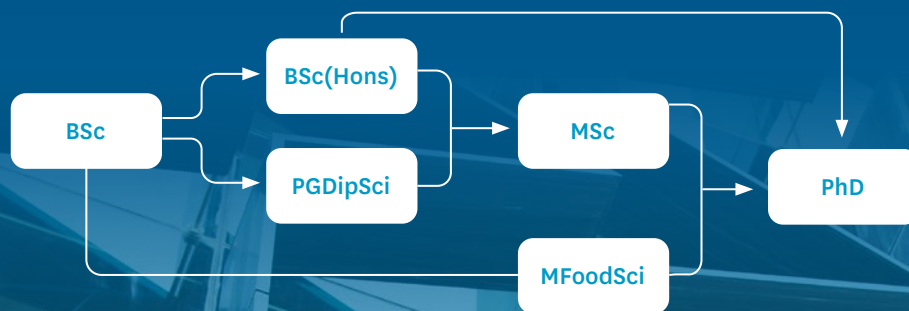
If you choose the Food Science pathway, you'll study topics like food manufacturing, processing and production, food components and their properties, food safety, and product development.

If you choose the Nutrition pathway, you'll study topics like human nutrition, the health and wellbeing of individuals and populations, and the environmental, social, economic and cultural influences on eating behaviours.

Food Science and Nutrition includes courses from Biological Sciences, Chemistry, Medical Science and Population Health, to answer questions like:

- What constitutes a healthy diet?
- Is there a way to engineer food to improve its nutritional value?
- How does the human body break down food to provide us with the energy we need?

Food Science and Nutrition involves many scientific disciplines. You'll find it useful to have a broad science background, including high school chemistry and mathematics for the Food Science pathway. High school biology, physics and statistics are helpful but are not essential. Note that high school food technology is not required.



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Career opportunities

Food Science

The food and beverage industry and food research institutes need well-trained Food Science graduates who can help to ensure safe, innovative and high-quality food production. Industry is constantly striving to meet consumer demands for foods that are not only safe but healthy, sustainable, natural, convenient and have good sensory properties to maintain wellbeing. Your day-to-day work could include research, food and ingredient manufacturing, food safety, product development and food analysis.

Nutrition

With an increasing awareness of the role of the foods we eat and their effect on health, our nutrition graduates are equipped to work in health promotion in the community, health policy in government, research, nutrition consulting as a registered nutritionist, nutrition information services, food industry, and the health and fitness industry. You could also choose to undertake specialised postgraduate training in order to register as a dietitian.

Our Food Science and Nutrition graduates can be employed in many aspects of the Food, Nutrition, and Health industries. Some examples are:

- Danone, and Danone Nutricia Specialised Nutrition, Nestle, Bronson & Jacob and other large food multinationals;
- Heinz-Watties, Synlait, Westland Milk, Fonterra, Ceres and many classic NZ food companies;
- Retail health consultant, Auckland Clinical Studies;
- Ministry of Primary Industries, The Ministry of Health and other regulatory and policy government roles;
- Registered Nutritionist at companies such as Radix Nutrition, Zespri;
- Public health positions at The Heart Foundation, Healthy Auckland Together, Health Promotion Agency, and Healthy Families NZ;
- Plant and Food Research and other research organisations;
- Many laboratory and testing companies.

If you follow the Food Science pathway, your study will include:

A consolidation of chemistry, biology and mathematics subjects in first year

Taking foods apart to look at the individual food components, their functionalities and nutritional quality

Food microbiology, food processing, food preservation, emerging technologies and their benefits

Product development

If you follow the Nutrition pathway, you'll study topics such as:

Human anatomy and physiology

Biochemistry and metabolism

Population health

The many factors influencing eating behaviours

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-food-nutrition



“I have always had a passion for creating food; from reading cookbooks, being hands-on in the kitchen doing little experiments and watching how it’s made via video online. But really keeping it all together by understanding all the processes that goes on behind bringing these products to life.

“My ultimate dream was to see something that I created on a supermarket shelf and being enjoyed by consumers, and a part of that started off with doing this degree.”

Bonnie Lam

BSc in Food Science and Nutrition (Food Science pathway).



Read Bonnie’s full story at: auckland.ac.nz/science/bonnie-lam

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Mātai Pūtaiao Matū Toitū

Undergraduate Green Chemical Science

Green Chemical Science involves the use of chemical principles, science and technology to advance society in ways that are sustainable and safe for the environment.

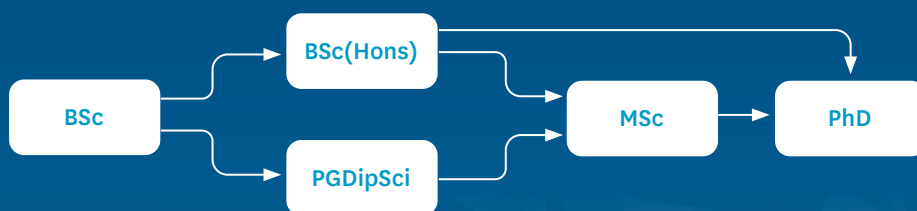
What you will learn

The approaches used in Green Chemical Science often involve interdisciplinary studies in catalysis, synthesis, toxicology, analytical methodology, materials science and biochemistry, in order to tackle global issues and problems that impact on sustainability.

As a Green Chemical Science student you'll have an interdisciplinary and highly practical learning experience. You'll study topics including pollution elimination, clean water production, production of materials from renewable feedstocks, mitigation of global warming, and the development of renewable energy technologies.

You can study Green Chemical Science as a specialisation in the Bachelor of Science (BSc) or a Bachelor of Advanced Science (Honours).

If you're interested in studying Green Chemical Science with us, it's a good idea to have taken chemistry at high school. High school biology is beneficial, but it's not essential. Mathematics, statistics or physics also provide helpful numerical knowledge.



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Career opportunities

A buoyant future in an interdisciplinary field

Businesses both here and overseas are fast realising that sustainability and reducing waste can lessen a company's environmental impact, increase their profit margins and improve consumer relationships.

What's good for the planet is good for business, and the demand for greener processes means there's an increasing number of jobs available in the area of sustainable science.

Green Chemical Science graduates may find themselves in multi-faceted spaces working alongside people with different skill sets to deliver the best products and processes.

As a graduate of this specialisation you'll be equipped with the necessary skills and knowledge to take advantage of these career opportunities, and to contribute to society in a meaningful and informed way.

Jobs for our Green Chemical Science graduates include:

- Biochemist
- Chemist
- Sustainability consultant
- Environmental consultant
- Environmental scientist
- Research chemist
- Scientific adviser

What you can study:

Pollution elimination

Clean water production

Production of materials from renewable feedstocks

Mitigation of global warming

Development of renewable energy technologies

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-green-chem

"I was excited to discover Green Chemical Science as an option because it instantly felt like a perfect fit for me.

"I have always wanted to go into a sustainability-related field, as I feel a moral obligation to the environment. Green chemistry has an environmental component and seems more applicable and currently relevant."

Araliya De Zoysa

BSc Green Chemical Science



Read Araliya's full story at:
auckland.ac.nz/science/araliya-dezoysa



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Mātai Matū Rongoā

Undergraduate Medicinal Chemistry

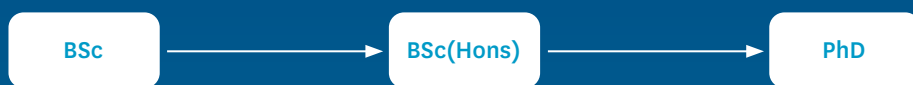
Medicinal Chemistry is the study of the design, biochemical effects, regulatory and ethical aspects of drugs for the treatment of disease. It's one of the most rapidly developing areas within the discipline of chemistry, both globally and locally.

What you will learn

If you want to be at the forefront of designing and discovering new compounds that are suitable for use as new drugs, and learn about how a substance operates in the body and its suitability for use as a drug - Medicinal Chemistry is for you.

As a Medicinal Chemistry student you'll gain a strong foundation in biological and chemical techniques that are relevant to the pharmaceutical world. You'll study the synthesis, reactivity and analysis of organic compounds, and you'll gain valuable insight into the pharmacological, regulatory and ethical aspects of these bioactive compounds.

If you're interested in studying Medicinal Chemistry with us, it's a good idea to have taken chemistry at high school. High school biology is also beneficial because of the biological/medicinal focus of this specialisation, but it's not essential. Mathematics, statistics or physics also provide helpful numerical knowledge.



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Career opportunities

A foundation of multi-disciplinary skills

Medicinal Chemistry is one of the most rapidly developing areas within the discipline of chemistry, both globally and locally.

Studying Medicinal Chemistry is designed to equip you with the multi-disciplinary knowledge and skills relevant to a rapidly expanding pharmaceutical industry.

You will have a unique combination of skills: you will be trained in the synthesis, reactivity and analysis of organic compounds and gain valuable insight into the pharmacological, regulatory and ethical aspects of these bioactive compounds.

As a graduate you tend to find employment in a wide range of institutions such as hospitals, biomedical and pharmaceutical companies, private research institutions, local and national government authorities and agencies and Crown Research Institutes.

Our Medicinal Chemistry graduates have been employed in the following jobs:

- Quality assurance technician, Unitech Industries Inc
- Technology specialist, ARI Limited
- Logistics coordinator, Napier Port

Other positions and roles include:

- Developing guidelines and reviewing new drug applications
- Drug development, including drug formulation
- Testing potential new bio-active compounds

What you can study:

Biochemistry

Pharmacology of the brain and body

Spectroscopy

Properties and analysis of matter

Nano-materials and bio-macromolecules

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-med-chem



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Mātai Ahupūngao

Undergraduate Physics

Understanding physics means to understand the laws of nature, and the nature of matter. Physics is arguably the most fundamental of all sciences – study Physics if you want a sharp insight into the world around you, and you want to apply that knowledge to environmental, medical, communications, and other real-world applications.

What is physics? And what can I do with it?

Physics is the study of how matter, energy, and forces work at scales from the very smallest fundamental particles up to the grandest scale of the Universe itself, and importantly everything in between!

It's also about using our understanding of physics to do useful things. This means we frequently work beyond physics in both inter- and trans-disciplinary studies. For example, to create new medical imaging or communication technologies.

What you will learn

All of modern science and technology is underpinned by physics. As a Physics student you'll gain an understanding of matter as well as training in experimental methods and the mathematical analysis of physical processes, such as energy and force.

Prerequisites

If you're interested in studying physics with us, taking mathematics in high school is a good idea, but it's not essential. However, starting your physics degree in the correct course is vital

to suit your experience. We have three courses in our first year to choose from depending on how much maths and physics you've completed at school. You end up in the same place, but the journey is designed to meet your needs.

Choosing a subject

With so many options it's sometimes hard to choose what you want to study, but we've got you covered. You can study a double major with our Bachelor of Science to gain a broader base of skills and knowledge.

Complementary majors include:

- Chemistry
- Computer Science
- Earth Sciences
- Environmental Science
- Environmental Physics
- Mathematics



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Career opportunities

A door to a range of opportunities

A Physics degree provides students with the skills they need to succeed and our graduates are found in a host of interesting jobs in New Zealand and around the world.

It's important to know the applications of physics are wide, so there is no 'typical physicist' job. Graduates have a wide range of career paths available to them. From patent consulting to weather forecasting, diverse opportunities await. You might find yourself in research, business, finance, IT, teaching, or the environmental and engineering sectors.

With a Physics degree you can plot a professional pathway that will take you places you've never been before.

Our Physics graduates are employed in a wide and varied range of careers and industries, for example:

- R&D for Fisher & Paykel Healthcare
- R&D for MacDiarmid Institute and Dodd-Walls CoRE spinout companies
- Software developer at Rocket Lab
- Teacher, Western Springs College
- Tester, Planit Software Testing - New Zealand
- Technical writer, Integrated Control Technology (ICT)
- Policy analyst, New Zealand Treasury
- Programmer, Catalyst IT

Other positions and roles include:

- Materials development
- Patent consulting
- Weather forecasting

What you can study:

BSc, BSc(Hons), BAdvSci(Hons) in Physics

Acoustics and seismology

Astronomy and Astrophysics

Nano and Materials Physics

Climate, atmospheric and ocean physics

Lasers and optics

Nuclear Physics

Quantum Physics

BAdvSci(Hons) in Applied Physics

Computational Science

Medical Physics and Imaging Technology

Nano and Materials Physics

Photonics

Space systems

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/ug-physics



“The fundamental laws that govern our universe have interested me since I was young. I enjoy seeing how we can take a small number of essential principles and use them to understand a multitude of diverse phenomena.”

Caleb Todd

BSc in Physics and Mathematics, BSc (Hons) in Physics



Read Caleb's full story at:
auckland.ac.nz/science/caleb-todd

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