

CHEMISTRY

AUT

A FUTURE IN
CHEMISTRY



WHAT IS A CAREER IN CHEMISTRY LIKE?

Chemistry is at the core of human existence, from the development of new medicines, to the cleaning up of our environment and creation of food products with enhanced nutritional features. Careers in chemistry involve understanding the chemical properties of matter, learning more about how chemical reactions take place and using this knowledge to solve human problems.

Because the scope of chemistry encompasses all matter on the planet, career opportunities are as wide and diverse as the ever-changing world in which we live. Chemists apply their knowledge to analyse samples, make new chemical compounds, improve industrial processes and produce new materials. Chemical science is behind many of the advances of the modern age, such as OLED screens in TVs and mobile phones, plastics used by 3D printers, new specialised pharmaceuticals and catalysts for the production of hydrogen gas from water.

Are you an enquiring, observant and persistent person? Are you a problem-solver who wants to do something that will make a difference to the world and its peoples? If so, a career in chemistry could provide you with a great set of possibilities for your future.

OUTLOOK AND TRENDS

Expansion and new technology – New technologies and products are being developed that have applications in the agricultural, food, pharmaceutical, mineral and cosmetics industries. Some areas are expanding very quickly, such as those related to new sources of energy and the development of forestry and dairy resources. Biotechnology and pharmaceuticals are also growing. Chemistry skills and knowledge play a vital part in these developments.

Environmental and occupational health careers – Changes in environmental, occupational health and safety legislation have increased employment opportunities for the public sector and industry. There is a corresponding growth in green chemistry, where the goal is to remove or at least reduce processes and products that harm people and the environment.

Analytical chemists – Opportunities are strongest in fields where more funding is available. For example, demand for analytical chemists, usually employed by industries such as paint, food production or plastics, continues to grow, providing strong job opportunities.

Research chemists in demand overseas – Chemists who work in research institutions to develop new products are in considerable demand overseas. Opportunities are lower in New Zealand because more new product research is done overseas. Finding work in pure research (often in a university) is more difficult due to limited funding and fierce competition.

Chemistry education – Secondary teaching continues to be a very strong career option for chemists. Chemistry is one of the subjects for which Teach NZ study scholarships are often available.

WORK SETTINGS

Chemists usually work a regular 40-hour week, although long-running projects may require evening and weekend work. While there is an increase in flexibility in working arrangements, many chemistry jobs include laboratory work, which involves working on-site. Some travel may be involved with projects or to attend conferences.

In New Zealand, chemistry graduates find employment in private and public organisations, often in production, service and research sectors. These include commercial enterprises, government department/agencies, research organisations or educational institutions.

Production and manufacturing industries

- Food and beverage production
- Chemical and related industries, such as pharmaceuticals, agrochemicals, petrochemicals, textiles, plastics, paint, metals and wood products

Service (people) industries

- Health and medical organisations (hospital laboratories, biomedical/biochemical research, medical analysis and toxicology)
- Pollution monitoring, water purification and forensic work
- Science communication, including content production, scientific writing, media and educational materials
- Education, teaching (secondary and tertiary)

Research organisations and agencies

- Crown Research Institutes (CRIs): AgResearch, Institute of Environmental Science and Research (ESR), GNS Science (leading provider of Earth, geoscience and isotope research and consultancy), Manaaki Whenua Landcare Research, National Institute of Water and Atmospheric Research (NIWA), Plant & Food Research, Scion (forestry) and Callaghan Innovation
- Government departments, laboratories, regional councils and private research organisations

Other roles

Although many chemists work in laboratories, an increasing number are employed in advisory roles, marketing, sales, management, or in government departments in key decision-making positions. A chemistry degree is also often an entry point into training as a patent attorney.

CAREER ROLE EXAMPLES

Roles at a technician level are achievable with a bachelor's degree. However, many research roles will require qualifications at master's or doctoral levels.

Chemistry technician – Prepares equipment, materials, products and specimens for experiments and surveys. Carries out field and site surveys and tests. Performs experiments and evaluates results. Records processes, outcomes and the conclusions reached. Writes reports and papers on research results. Orders laboratory supplies and equipment and maintains databases.

Senior research chemist – Studies the synthesis, characterisation and properties of new chemical compounds and catalysts to aid the industrial-scale synthesis of chemicals and drugs for disease treatment at a tertiary or research institute. Part of a highly skilled team in a chemical laboratory – possibly the manager. Has a postgraduate research background. Publishes research results in international scientific journals, presents papers at overseas conferences and obtains patents on new results.

Raw material sampler – Carries out sampling of raw materials (ingredients and packaging) prior to use in a manufacturing plant. Ensures that materials are sampled on time, entered into the relevant systems and reach the laboratory on time. Performs sampling of finished products and staff training. May be involved in development, writing and implementation of procedures.

Technical sales representative – Develops new business for the organisation, establishing new contacts and accounts. Supports the development of sales and marketing plans. Provides sales service and technical knowledge to customers. Works in a team to generate proposals, quotations, and tailored, innovative, commercially effective solutions. Contributes to continuous improvement of business performance.

SKILLS AND KNOWLEDGE

Skills

- Apply analytical thinking to the solution of problems
- Analyse and interpret research results and other data
- Use practical technical skills for laboratory experiments and to operate equipment
- Possess strong written and verbal communication skills
- Participate effectively as a member of a team
- Accurately follow instructions and think independently
- Apply skills and knowledge in situations that may differ widely from what was encountered at university
- Understand tikanga Māori and responsibilities with regards to Te Tiriti o Waitangi

Knowledge

- Have a thorough understanding of chemistry and chemical compounds
- Competent at safely handling, storing and producing large quantities of chemicals
- Solid understanding of quality systems (e.g. NZS/ISO/IEC 17025)

PERSONAL QUALITIES

- Accurate and observant with an eye for detail
- Patient and persistent, able to deal with setbacks in their research
- Enquiring, enthusiastic and motivated
- Able to think creatively about new research methods and new uses for chemicals
- Well organised, methodical and a good planner

SALARY GUIDELINES

Science salaries vary depending on role, experience and location.

	Salary (per year)
Chemistry graduates starting salary range	\$55,000-\$65,000
With at least 5 years+ experience	\$85,000-\$130,000+

This information was accurate at the time of publication (October 2024) and should only be used as a guideline.

Keep up to date with salary data by visiting these websites:

Prosple Graduate Salary Guide

nz.prosple.com/on-the-job/whats-the-average-graduate-salary-in-new-zealand

SEEK

seek.co.nz/career-advice/search/science

Careers NZ

careers.govt.nz/jobs-database/science/#industry-science

PROFESSIONAL REGISTRATION

Registration or professional membership is not a requirement in most areas; however it may be an expectation of some employers.

THE AUT APPROACH

In addition to theoretical content, AUT Chemistry graduates benefit from small class sizes and a strong emphasis on practical skills, including the application of chemistry to real circumstances and the development of essential practical laboratory skills needed to be successful in scientific employment.

FURTHER STUDY OPTIONS

AUT offers a range of postgraduate options in chemistry, including the Bachelor of Science (Honours), Master of Science and Doctor of Philosophy.

Staff research interests include co-ordination chemistry, bioinorganic chemistry, synthetic organic chemistry, medicinal chemistry, biological chemistry, ionic liquids, analytical chemistry, and catalysis.



EDEN HOLDAWAY-YOUNG

Technical Services Officer, Douglas Pharmaceuticals

Bachelor of Science in Chemistry and
Biomedical Science

"I am a technical services officer at Douglas Pharmaceuticals. After doing a 12-week summer internship I was offered a permanent role here. As a technical services officer, I work in different teams within the department. I have spent time in process engineering and process validation, and I am now in the cleaning process development team.

My role focuses on cross-contamination monitoring and prevention. This role exists to ensure no traces of active pharmaceutical ingredients or other materials are contaminating another product, which is vital to patient safety. My team does this by taking surface samples from equipment, analysing and trending results and making recommendations to ensure the absolute quality of the product.

Some of my work is computer-based, but I also spend a lot of time physically sampling in different areas of our production facilities. I love seeing the manufacturing plant running. It is so rewarding to watch raw chemical materials become medications that are going to help people all over the world.

Verbal and written communication skills and collaboration are massively important. I write technical documents and liaise with other departments, such as quality control, microbiology, quality assurance and manufacturing teams.

I also need skills in working with sensitive chemicals, applying process capability statistics, being compliant with all GxP systems and determining the characteristics of active pharmaceutical ingredients. It has become second nature to take a science-based approach to everything. It is a fantastic industry, and I love the variety I have day to day."

TIPS

"Be approachable on LinkedIn. Say yes to opportunities and have an open mind. It is very important to be able to work accurately and to a high standard because patient safety relies on product quality, which starts with being a quality human being who is passionate about it."

EMPLOYER COMMENT

"We look for graduates who can solve problems and work in a collaborative environment. We need good communicators who can translate the mystical language of science into something even your cat could understand, while passionately connecting with our mission to improve lives.

For our intern programme, we also want a strong GPA because innovation, critical thinking and intelligence are all essential in the whirlwind world of pharmaceutical development and manufacturing.

From the start, Eden was a beacon of infectious energy, asking questions and sprinkling curiosity like confetti. She is super smart, engaging and very resilient. A problem-solving superstar, Eden thrives in a collaborative and cross-functional environment, and we genuinely feel lucky to have her on our team.

Graduates need to be curious, speak up and get involved. You need to remember why you took this path. You need more than 'I was good at science'. We want to hear about that personal spark that ignited your journey into science."

Rochelle White
Douglas Pharmaceuticals Senior
Recruitment Consultant

USEFUL WEBSITES

Royal Society of Chemistry

rsc.org/careers

New Zealand Institute of Chemistry

nzic.org.nz

International Union of Pure and Applied Chemistry

iupac.org

American Chemical Society


acs.org/careers/chemical-sciences.html

FURTHER INFORMATION

For more information on studying chemistry and the Bachelor of Science, visit aut.ac.nz/chemistry

EMPLOYABILITY & CAREERS


For employability and career support, AUT students can book an appointment through elab.aut.ac.nz/

 @AUTEmployabilityandCareers

FUTURE STUDENTS

Contact the Future Student Advisory team for more information: aut.ac.nz/enquire

futurestudents@aut.ac.nz

 @FutureStudentsofAUT

CURRENT AUT STUDENTS

Contact the Student Hub Advisors team for more information: 0800 AUT UNI (0800 288 864)

aut.ac.nz/enquire | studenthub@aut.ac.nz

CITY CAMPUS

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