Waipapa
Taumata Rau
University
of Auckland



Chemical and Materials Engineering

LEARN MORE

Chemical and Materials Engineering involves the transformation of new and novel chemical, materials, and biological discoveries into large-scale practical applications with optimal products and processes.

Offered by our Department of Chemical and Materials Engineering, this specialisation may suit you if you are interested in chemistry, mathematics, physics, and taking on the key challenges that are facing humanity, such as those in sustainability food, water, energy, and health and wellbeing.

Te Herenga Auaha, Faculty of Engineering and Design

HEALTH AND WELLBEING

Today's chemical engineer is also a biochemical engineer, a tissue engineer, and even a biomaterials engineer. You will learn about the relevant processes in molecular biology and biocatalysis, and apply them to materials engineering aspects to discover how new and functional biomaterials are designed and manufactured.

WATER

The great demand for new clean water is exacerbated by the need to also keep our existing water resource clean. You will learn the relevant theory and techniques in biotechnology and bioprocessing, membrane filtration and reverse osmosis, and chemical and enzyme kinetics — to transform polluted water to clean water.

INNOVATIVE PROCESSES

Our industries require innovative engineering applications in production and manufacturing to remain competitive, and to meet global marketplace standards. There is also increasing motivation to improve safety and sustainable practice. As a chemical engineer, you will be trained to be fluent in unit operations, applied physical chemical processing, process control, and machine learning with big data processing.

FOOD

Our goal is to make better use of our resources, improve the way food can be mass produced, and create technologies for new foods. The subjects covered are rheology, transport phenomena, and thermodynamics, which will provide the fundamentals required for solving problems in this area, and advanced electives include topics such as spray drying, food texture characterisation and food process control.

NEW AND NOVEL MATERIALS

The materials engineering focus of our degree equips our chemical engineers with an advantage over others in New Zealand. Our curriculum covers the vast range of materials, their properties and characterisation, as well as the selection of — and techniques to — create new and novel materials, from the nano to the micro and macro scales.

ENERGY

The study of energy processes is essential to this field — you will develop a sound understanding of the practical applications of thermodynamics, and concepts like chemical potential, fugacity and activities, and applications to vapour-liquid equilibria and chemical reactor engineering.