Waipapa
Taumata Rau
University
of Auckland



Engineering Science

LEARN MORE

Engineering Science focuses on using advanced mathematics, computation, and data to model, design, and optimise solutions to real world problems.

Offered by our Department of Engineering Science and Biomedical Engineering, this specialisation may suit you if you enjoy using mathematics and computers to solve practical problems. You will learn how to use mathematics, programming, optimisation methods, and machine learning to create solutions in diverse fields including resource management, advanced engineering consulting, sustainable energy, finance, and computational mechanics applications.

Te Herenga Auaha, Faculty of Engineering and Design

COMPUTATIONAL ENGINEERING

Computational Engineering uses mathematics, physics, advanced computational techniques, and high-performance computers to solve complex engineering problems across a broad range of fields. These include the automotive and aerospace industry – in environmental, geothermal, and energy systems, fluid dynamics and mechanical analysis for wind energy, sailing and acoustics, and industrial and biomedical applications.

ADVANCED ANALYTICS

Advanced Analytics solves complex, data-rich engineering problems using sophisticated computational methods. We use data mining, machine learning, neural networks, forecasting, network analysis, statistics, and simulation, with an emphasis on time-series analytics and inverse problems. We develop techniques and tools to discover deeper insights, make predictions, and generate recommendations across a range of applications, including predictive maintenance, optimal engineering design, non-destructive evaluation of materials, and healthcare.

OPERATIONS RESEARCH

Also referred to as 'the science of better', Operations Research involves the use of mathematics, computation, data, and optimisation methods to improve systems and processes, improve decision-making, and make predictions in application areas across business, government, and industry. Specific application areas for Operations Research include the efficient management of electricity and power systems, optimisation of production in industrial settings, business rostering, emergency services and vehicle routing, sports tournament scheduling, and optimisation of healthcare planning.