*What can I do with a degree in*
**Financial Engineering?**

UNIVERSITY OF CANTERBURY
*Te Whare Wānanga o Waitaha*
CHRISTCHURCH NEW ZEALAND

# Financial Engineering.

## What is Financial Engineering?

Want to understand the complexity of capital markets? Or how to manage different types of risks? Interested in achieving a challenging technical degree with flexible career opportunities?

Financial Engineering is a cross-disciplinary field combining financial and economic theory with the mathematical and computational tools needed to design and develop financial products, portfolios, markets, and regulations.

Financial engineers manage financial risk, identify market opportunities, design and value financial or actuarial products, and optimise investment strategies.

Studies in Financial Engineering provide a breadth of technical skills and knowledge across finance and economics, mathematics and statistics, and computer science and software engineering.

## Learn more

It is important to do some research when planning a future career. Speak with, ask questions of, and follow relevant professional bodies, organisations, companies, thought leaders and industry professionals to learn more about:

- Career opportunities, work environments and salary information
- Education and training requirements.

### Examples of professional bodies

- The New Zealand Data Science and Analytics Forum 💻 www.analytics.org.nz
- International Association for Quantitative Finance 💻 www.iaqf.org
- Financial Engineering and Banking Society 💻 www.febsociety.org
- New Zealand Society of Actuaries 💻 www.actuaries.org.nz
- Transforming Data with Intelligence 💻 https://tdwi.org/
- Institute of Analytics Professionals of Australia 💻 www.iapa.org.au

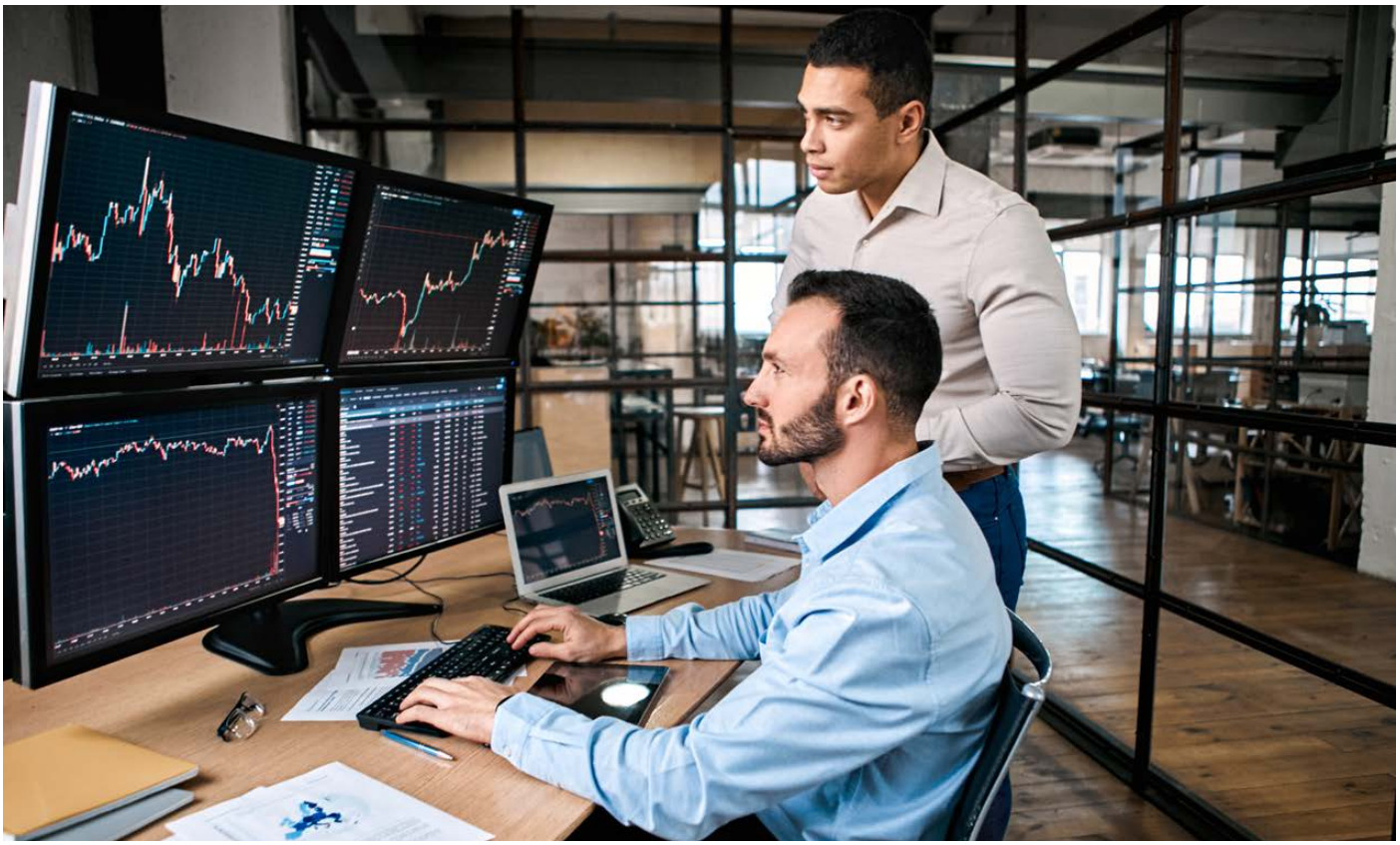
## Career and study information

Some study pathways and degrees have a recommended school background, and some careers may require further study beyond a first degree or additional experience.

### Gather helpful information from:

- Subject-specific content at 💻 www.canterbury.ac.nz/study/academic-study/subjects/financial-engineering
- Job profiles on career websites like 💻 www.careers.govt.nz
- Job adverts/vacancy descriptions
- Industry professional bodies.

This resource is part of a set of brochures focused on subject majors; many can also be studied as minors.



## What skills can graduates gain?

Through studying a degree in Financial Engineering, graduates develop a valuable set of skills and competencies that can include:

- Applied financial, mathematical and statistical problem-solving skills
- Ability to design and develop a new financial product, instrument or investment strategy
- Technology literacy
- Programming
- Numeracy confidence
- Strong quantitative and analytical abilities
- Ability to critically review new information
- Problem solving
- Communication
- Teamwork.

### What do employers look for?

Many employers look for generic skills such as communication, client/customer-focus, bicultural competence, cultural awareness, teamwork and initiative.

With technology, globalisation, and other drivers changing society, skills such as resilience, problem solving, and adaptability are important.

Skills that are likely to grow in importance include analytical and creative thinking, systems thinking and technological literacy.*

**World Economic Forum: www.weforum.org/agenda/2023/05/future-of-jobs-2023-skills*

### How can these skills be developed?

- Some skills are gained through studying
- Extra-curricular activities can help, such as getting involved in clubs, mentoring, cultural groups, part-time work or volunteering
- Be open to professional and personal development opportunities, whether it is undertaking work experience, overseas exchange, skills seminar, or joining an industry group.

## Where have graduates been employed?

Employment prospects for graduates in financial engineering and related fields extend across various sectors, including the broader actuarial and business analytics industries.

Graduates from Financial Engineering and related disciplines have found work in:

- Professional advisory services e.g. Deloitte, and Liger Trading NZ
- Financial and investment services (including data analysis and risk management) e.g. Macquarie Capital, BNY-Mellon, First NZ Capital
- Carbon trading and advisory services e.g. Carbon Market Solutions
- Electronic trading and security services
- Banking e.g. BNZ
- Insurance e.g. Vero Insurance
- A wide range of government/public agencies and bodies e.g. Treasury, Stats NZ, Ministry of Business, Innovation and Employment, Reserve Bank of New Zealand, and other regulatory bodies.

# What jobs and activities might graduates do?

Financial Engineering graduates are ready for the international workplace in the finance and analytics industries. Financial engineers could be involved in derivatives pricing, financial regulation, corporate finance, portfolio management, risk management, trading or structured products.

See some job examples below.

Note: This list is not exhaustive, and some jobs may require further study, training or experience. It is recommended to start with the section 'How can I gain a sense of career direction?'

### Financial engineer

- Keep abreast of current financial markets and theories, and past market performances
- Develop simulations and predict behaviour
- Use modelling to decide on saving, investing, borrowing, lending, and managing risk

### Investment broker, investment trader, share broker, financial trader, quant trader

- Develop systems, algorithms, relationships and strategies to maximise assets and minimise financial risk
- Specialise in stock, bond or other markets
- Make investment transactions and may offer advice to a client or organisation

### Actuary

- Assess the likelihood of a particular event occurring and the possible financial costs
- Look at past trends to predict future outcomes
- Present reports, explain implications, and give advice (often to non-specialists)

### Money market trader

- Optimise investments and maintain liquidity in line with objectives, risk tolerance, and regulatory compliance
- Trade short-term, low-risk financial instruments in the money market

### Quantitative trader

- Execute trades based on quantitative models and algorithms to generate profits
- Manage risk by monitoring positions, making real-time adjustments, and setting risk limits
- May perform market analysis

### Quantitative research analyst

- Develop automated trading strategies
- Implement statistical trading models
- Generate research ideas, build datasets, conduct statistical data analysis

### Investment analyst

- Undertake fundamental analysis for securities
- Provide buy or sell recommendations

### Risk analyst / manager

- Identifiy and manage strategic, operational, and other risks e.g. credit or regulatory risks
- Develop and maintain risk management policies, procedures, and frameworks
- Oversee engagement and compliance, and support staff in managing risks

### Business analyst

- Utilise data and analytical models for organisational information purposes
- Provide insight to inform business decisions
- Liaise with different areas of the business

### Statistical analyst, data scientist

- Collect, analyse and interpret data
- Use statistical techniques and models to identify and forecast results, trends and needs
- Present information to assist decision-making

### Examples of other job titles and careers include:

- Technology consultant
- Research analyst
- Professional sports bettor.

# Further study options

Financial engineering graduates can engage in further study from honours up to a masters.

Further study may facilitate career benefits such as specialist skills, entry into a specific occupation, higher starting salary, faster progression rate, and advanced research capability.

It is important to determine which, if any, further study options align with future career aspirations.

For further UC study options visit:
💻 www.canterbury.ac.nz/study/academic-study

# How can I gain a sense of career direction?

Understanding yourself and others is important to gain a sense of direction. This grows with experience; therefore, trying new things and reflecting on an ongoing basis is important.

## Career planning checklist

❑ **Discover and reflect on:**

- Your values, interests, strengths, abilities, and aspirations
- Your connection to whānau, people, and places
- Lifestyle preferences and location
- The skills you want to gain, use, or enhance

❑ **Engage in a variety of experiences to learn about:**

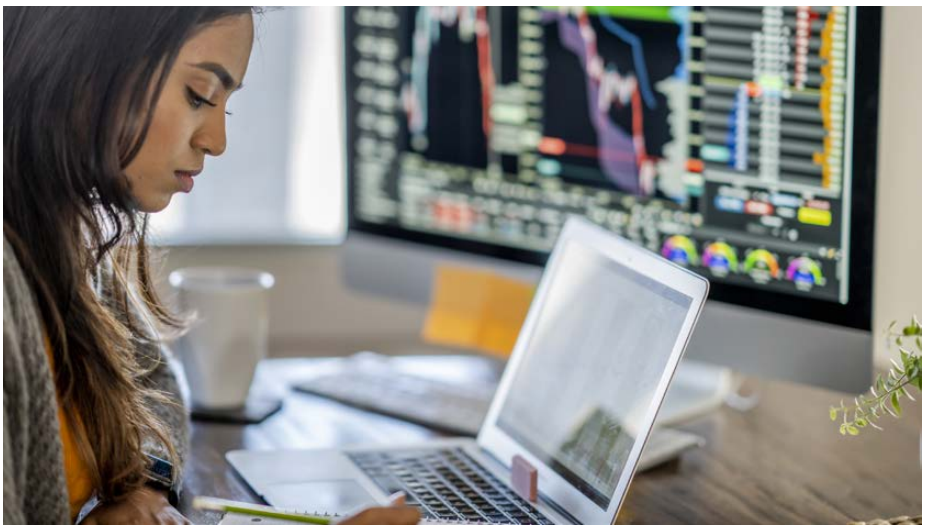
- How you want to contribute to society, the environment, and global challenges
- The tasks, responsibilities and work environments you prefer
- Your work values, priorities and interests

❑ **Learn more and gather career and study information**
(refer to page one of this resource)

- Speak with people working in careers that interest you; check the realities of a job/career
- Gather information from various sources

❑ **Identify your next steps**

- Talking to a career consultant can help you to identify your next steps. Visit: 💻 www.canterbury.ac.nz/life/jobs-and-careers



# What have other students and graduates done?

Explore career stories of students' university experiences and UC alumni who make a difference globally in varied ways.

Visit: 💻 www.canterbury.ac.nz/about-uc/why-uc/our-students/student-stories

## Nicholas

Research Assistant, Te Pūnaha Matatini

Bachelor of Science with Honours in Computational and Applied Mathematical Sciences

Bachelor of Science in Financial Engineering and Statistics

### What attracted you to Financial Engineering?

The wide range of courses in the Financial Engineering degree was the biggest draw. I knew I wanted to study some form of mathematics/statistics at university, and Financial Engineering allowed me to tie in some Computer Science, Finance, and Economics. The Statistics major followed naturally as it strengthened the quantitative aspect of my degree.

It provides an awesome range of subjects that I couldn't get any other way. They all relate to each other more than I expected. Taking the courses in this way provides insights you wouldn't have if you just took one subject. This means you have to cover a lot of background material to stay up-to-date in all subjects.

### Tell us about some of the skills you used in your work experience:

We used techniques learned in econometrics and data mining to help World Vision plan and allocate their time in schools more effectively. Using tools from class in the real world allowed us to truly understand how our theoretical knowledge is actually applied to real problems.

### What did you do during your PACE course in Thailand?

Here I worked in a small (but rapidly growing) business, using my statistical, machine learning, and computer science knowledge to automate internal report generation. This saved them significant time as they no longer needed to hand-prepare these reports. There was also the opportunity to introduce some more "intelligent" systems, such as internal connection suggestions, to keep them ahead of their competition.

### How has your study been useful out in the field?

Employers in the financial sector are usually looking for strong quantitative skills. Taking a double major with Financial Engineering and Statistics (or Mathematics) is pretty ideal.

# Career guidance

Career services are available for future and current students, and recent graduates. To learn more, contact:

Te Rōpū Rapuara | Careers
T: +64 3 369 0303
E: careers@canterbury.ac.nz
💻 www.canterbury.ac.nz/life/jobs-and-careers

### Helpful career insights

- Speaking with employers is key to finding opportunities; not all jobs are advertised
- Developing an online presence is useful as employers can search for future employees online
- Learning about recruitment patterns and where to find opportunities is important.

# Study advice

Student Advisors at UC help with questions focused on starting, planning and changing studies. To connect with Student Advisors, visit:

💻 www.canterbury.ac.nz/study/study-support-info/study-support

### Future students – contact:

The Future Students team
T: 0800 VARSITY (0800 827 748)
E: futurestudents@canterbury.ac.nz

### First year students – contact:

Kaitoko | First Year Student Advisors
T: +64 3 369 0409
E: firstyearadvice@canterbury.ac.nz

### Continuing students – contact:

Te Kura Pāngarau | School of Mathematics and Statistics

T: +64 3 369 2233
E: MathStatsEnquiries@canterbury.ac.nz

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*Career profiles and the information in this brochure were correct at the time of creation but are subject to change.*