Forensic Analytical Science
Pinpointing who where and what...

“I got interested in forensics like most people by watching CSI on television but the FORS programme showed me that forensics is far more fascinating in real life”

Hannah Kim BAappSc
(Forensic Analytical Science)
Korean Crime Scene Investigator,
Korean Police Agency

Your unique-ness isn't limited to your DNA or your fingerprints ... forensic chemistry can pinpoint where you've lived, what you've eaten and where it lived... that unarguable proof of origin is increasingly useful for food producers, and biosecurity officers as well as crime fighters.

Analytical science is increasingly being applied forensically in business; for compliance with legislation, marketing and the protection of products and brands from fraud.

This degree focuses on the vital analytical techniques of Forensic Biology (including DNA) and Forensic Chemistry (spectroscopy, traceability). These analytical skills are highly sought-after in all sorts of areas: in industry, government agencies and regulatory bodies tasked with managing natural resources.

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**Why study Forensic Analytical Science?**

The most counterfeited item in the world is the NZ Kiwifruit. New Zealand's produce is often at the top end of the market, and well worth counterfeiting – if you can get away with it! The techniques you'll learn in this course can determine the exact point of origin for foodstuffs; this protects our products abroad, and protects our growers at home as well, identifying the source of biosecurity risks when they hit our shores.

The techniques are applicable to criminal forensic work as well, and the analytical skills learned will have much broader applications across a wide range of scientific fields.

**Career opportunities**

Anyone involved with Resource Management Act needs staff who can understand analytical science for example in the management and custody of natural resources; the analytical techniques you'll learn in Forensic Analytical Science will help track down sources of contamination.

Traceability gives the edge in niche marketing for top end products; now we can prove exactly where a product has come from, protecting it from counterfeiting and giving a market advantage.

Government agencies increasingly require people with this kind of analytical training e.g. Department of Conservation workers coming across questionable logging would be able to demonstrate whether timber had come from illegal sites.

Postgraduate training in forensic work, available from University of Auckland or several other international providers.

Applicants should be aware that the job market in New Zealand for criminal forensic scientists is small and that this course is not a qualification for such a career without further study or employment experience.

**Background required**

While entry into the Applied Science programme in Forensic Analytical Science is open to anyone, we strongly recommend that you have NCEA level 3 Chemistry, Biology and Maths (Stats). Strong skills in English would also be beneficial.

**What is the BAppSc?**

The strength of the Applied Science programme is its outward focus – developing market-ready graduates with wide-ranging skills and practical experience in the workplace.

The Applied Science programme is a three-year undergraduate degree with open entry at 100 level. An Honours year is offered to those students who achieve an appropriate academic standard. This will be offered at the end of the undergraduate degree.

Every Applied Science degree has a compulsory minor or second major, in a subject area that's directly relevant and will deliver complementary skills. The programme encourages real-world business awareness, enabling you to apply what you have learnt to any organisation you work for.

**What will I study?**

**First year** – papers worth at least 126 points, to include, BIOL 192, CELS 191, chem 191, HUBS 191, STAT 110 or 115.

At least one of BIOL 123, CHEM 111, HUBS 192, MATH 160 or PHSI 191 is recommended.

In your second year, as well as the required papers in Chemistry, Forensics and Genetics, there is a wide range of options including Biological Anthropology, Genetics and Biochemistry, Fibre Analysis, Microbiology and Pharmacology as well as Statistics.

**2nd year** – papers worth at least 120 points, to include CHEM201 or 205, FORS 201, GENE 222.

And at least two of BIOA 201, BIOC 221, CHEM 201 or 205, CHEM 204, CLTE 203, FOSC 201, GENE 221, MICR 221, 222, PHAL 211, 212, STAT 242, 261.

**3rd year** – papers worth at least 120 points, to include FORS 301, CHEM 306.

And at least two of BIOA 301, BIOC 352, 354, CHEM 304, CLTE 303, FOSC 301, GENE312, 315, PHAL 306, PYSC 325, and 300-level MICR and STAT papers.

Third year extends the range even further with Food Science and Psychology.

**What will I learn?**

This degree will focus on the vital analytical techniques of Forensic Biology (including DNA) and Forensic Chemistry (spectroscopy, traceability). The key strength will be the analytical skills acquired.

**How will I learn?**

The programme is delivered using lectures and practical labs. There may be some fieldwork component in the optional areas of study.

**Combining Forensic Analytical Science with other subjects**

All Applied Science majors require either a minor or second major. For Forensic Analytical Science there are loads of possible pairings, depending on the kind of emphasis you want in your career: team FORS with Environmental Management or Applied Geology; with Food Science or Clothing and Textile Science; with Marketing or International Business; Psychology, Biochemistry, Microbiology, Anatomy.

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**PROFILE**

**Hannah Forrest**

Bachelor of Applied Science and Master of Applied Science

Schools Communication and Engagement Officer, King's College London

There was never really any question as to what Hannah Forrest would study, she says.

“I’ve been interested in science and forensics for as long as I can remember. At primary school the science experiments were always my favourite. I hate to say it, but ever since all the forensic shows first came on TV – and I saw the real difference science can make in the world – I’ve been intrigued.”

Hannah gained a Bachelor of Applied Science and Master of Applied Science from Otago, which was the only New Zealand university that offered a forensic undergraduate programme.

“Forensic Analytical Science is taking scientific techniques and applying them to an investigation of a crime. It is, simply put, scientific problem solving,” she says.

“My thesis involved analysing part of the chemical composition of human hair and determining the recent geographic location of that person. I then applied this to the real world application of an explosion to see if the technique stands up in extreme environments. I got to carry out a controlled explosion experiment – that was a good day at the office”

Choosing to do a science degree doesn’t mean you have to become a ‘scientist’, says Hannah, who now works at the Faculty of Life Sciences and Medicine at King’s College London, communicating science to different audiences in creative and interesting ways.

“The breadth of the applied sciences degree meant that I was able to get a wide knowledge of many subjects. One of the most useful skills I learned was being able to communicate different and difficult scientific concepts to different people who could then do something with that information. This is essential in the real world and has definitely helped me in my recent jobs.”

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For questions about Forensic Analytical Science

otago.ac.nz/appliedscience