UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND
SAPERE AUDE

Software Engineering

Future-proofing software

Computer information and control systems have become increasingly embedded into the very fabric of human society. They control our clocks, washing machines, motor vehicles, traffic lights, the electric power to our homes, and the essential processes of our production economy.

These computer systems are complex and can no longer be thought of as standalone entities. They are typically components of much larger, complex systems involving hardware, software, people, and all the unpredictable events in the natural world. So it is essential that those building these complex systems be equipped with advanced techniques not taught in ordinary computer programming courses.

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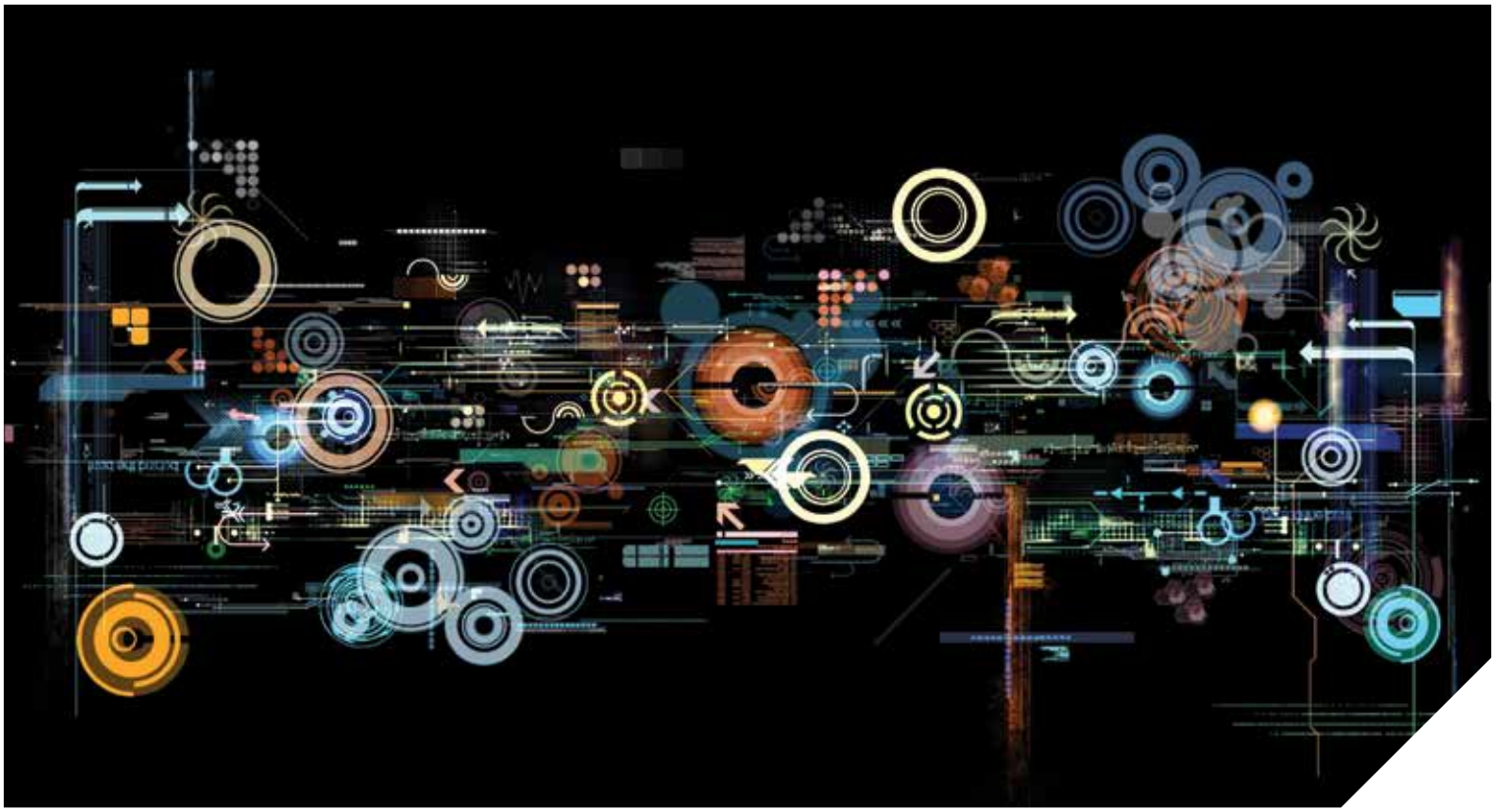

Some reasons for studying Software Engineering

Software engineering requires modelling and understanding complex interactive systems, as well as identifying how the performance of computer information systems can be improved. It also includes managing the construction of the information system components, and ensuring procedures are in place for continual testing and maintenance.

- You'll be able to join a highly sought-after profession. New Zealand's (and the world's) future depends on having technical experts who can oversee the construction of the complex information systems that will underpin the new knowledge-based society.
- You'll gain the expertise to enter a fast-growing industry with highly-paid job opportunities, where innovation is rewarded.
- You'll discover the satisfaction of devising and modelling systems, and then testing them under a range of operating conditions.

What will I learn?

You'll learn about databases, mathematical applications, software development, and strategies for using computers to solve real-life problems. You'll cover issues like systems design, where you'll assess software on issues like usability and visual appeal. You'll also learn how to manage and coordinate a software project, taking into account modelling, costing, risk, organisation and resourcing.

Career opportunities

Software Engineers are among the highest-paid professionals in most countries of the world. Countries like Japan and the United States are relaxing their immigration laws in order to address critical shortages in this area.

Software engineers are not only in demand at software companies, but are also sought after in a range of other organisations involved in the development of significant information systems. This includes governments, telecommunications companies, the chemical industry, biomedical industries, financial institutions, agribusinesses, pharmaceuticals, healthcare sector corporations, engineering and manufacturing firms.

While the work of software engineers can often involve developing interactive, user-friendly applications to be used by companies and individuals, it can also involve the development of a considerable amount of "behind the scenes" software. This can include systems to improve the management of e-commerce, or to improve the security and privacy of Internet transactions.

There is enormous scope to establish new start-up organisations throughout the information technology and telecommunications industries. This might mean anything from designing an interactive application for use on the Web, to developing your own line of software to meet the needs of a particular sector, such as tourism or finance.

Background required

Students from a range of backgrounds are welcome to study for Otago's BAppSc in Software Engineering. There is some flexibility in entry requirements, but Year 13 mathematics is recommended. Experience or familiarity with computing also helps, but it is not essential.

What is the Bachelor of Applied Science?

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.

Applied Science 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 learned to any organisation you work for.

What will I study?

The required papers at 100-level are: BSNS 106, COMP 160, and one of MATH 150, 160, 170, FINQ 102.

From second year, you'll study a wide range of information science and computer science papers, which lay the foundation for advanced papers in Software Engineering. There you'll look at the development process of large scale, reliable, and maintainable software.

NB: Check the latest paper details in the *Guide to Enrolment* published with enrolment material each year.

How will I study?

As well as attending lectures, you'll spend a lot of time in Otago's well equipped computer labs, gaining valuable hands-on experience.

Can I combine my Software Engineering study with other subjects?

A minor or second major is compulsory for the Bachelor of Applied Science. Your first year course is very flexible and you can select papers that keep your options open for second year – for example you can tailor a course that will also cover the prerequisites for most of the other BAppSc subject majors, or you could carry on with a BSc in Energy Studies, Mathematics or Physics.

The minor or second major you choose will tailor your studies to match your own particular strengths and passions, but also match demand from industry, for the skill-sets most needed.

PROFILE Duncan Meyer

Duncan Meyer found out about the applied science programme by chance: he was checking to see what he needed to complete a BSc and found that he had already completed most of the first year papers for Applied Science. The blend of science and business suited his needs perfectly.

"I chose software engineering because it balanced the pure science aspects of information technology with broad base of business papers. I wanted to make sure I understood the industry as a whole, not just the technical aspects."

The diversity of skills taught in the Software Engineering course really appealed to Duncan, and gave his study plenty of variety to keep him interested and on his toes!

"I particularly enjoyed learning fundamental skills such as writing software applications and then diversifying into commercial areas like finance and management. This variety meant that each semester was different and would hold a new challenge."

Duncan has found that the software engineering course in Applied Sciences was the perfect fit for his current job, working as a project manager for Hewlett Packard.

"I currently manage a team of 20 software developers creating a large application for the New Zealand government. The fundamental principles of software engineering combined with the commercial knowledge that project management requires means my time at Otago was well spent."

So what advice did Duncan have for students considering Software engineering?

"The IT industry is incredibly varied: the broad range of subjects within the software engineering course will prepare you for whatever it has to throw at you."

For questions about
Software Engineering
otago.ac.nz/softwareengineering