



Bachelor of Computing and Mathematical Sciences (BCMS) Computer Technology



What is Computer Technology?

Computer Technology is the study of the hardware and software that are the foundations of modern computer systems. Computers are now a fundamental part of everyday lives, controlling everything from toasters to nuclear power stations. The need to build and deploy effective computing infrastructure is now crucial to business and other organisations.

Operating systems are computer programs that control computers – allowing us to store information and run application software. They must support new hardware with multiple processors, ever faster and larger memories and a myriad of accessories and add-ons. You'll go beyond Microsoft Windows to learn about alternative operating systems, how operating systems work, and how to set up secure systems.

Modern computer systems depend on the networks that interconnect them. Once built on telephone lines, these networks now run on optical fibres and carry millions of voice and video conversations. The demand for people who have the skills to build new and better networks is ever expanding; today's applications require more speed, mobility, reliability and capacity than yesterday's, and tomorrow's networks will even more. You'll gain those skills – learning from networks lecturers who have significant industry experience themselves, and who can show you cutting-edge research and development in this field.

Course of study



Computer technology students study a mix of hardware and software courses right from the beginning. In your first and second years, you'll concentrate on programming and electronic design. In your second year you'll also study modules in communications and computer systems.

In the third and fourth years options include specialist courses in networks, operating systems and computer architecture. You can also choose advanced electronics options, taught by Physics and Engineering. Fourth year student projects have included computer processor design and implementation, designing and building specialised communications equipment, designing and implementing a system for automatic configuration of a large test network, and building a prototype embedded device enabled for the next generation Internet protocols.

Why should I study Computer Technology?

- ✔ You will have the skills to implement innovative computing solutions for new situations.
- ✔ You will understand the world's most advanced computing and network technologies, and know how to harness their power effectively to meet the needs of industry and society.
- ✔ You will be studying at Waikato, the first home of New Zealand's connection to the Internet and one of the leading network research institutions in the world.
- ✔ You will gain a qualification that allows you to join an industry that has a strong demand for new workers and high rates of pay for computer technology specialists.

Career opportunities

There are three main areas that computer technology specialists work in:

- ✔ **Computer hardware.** Although most PCs are made in Asia with chips designed in the US, there are companies all over the world designing specialised hardware for particular situations. This includes a significant number of New Zealand companies. Products include embedded systems, industrial controls systems, communications hardware, specialised peripherals and mobile devices such as GPS and digital radios. Careers include hardware design, firmware and software programming, test and measurement, requirements analysis and product support.
- ✔ **Systems software.** Most medium and all large organisations have specialised computer servers and other resources that require management. Careers include system design, capacity planning, system administration, systems programming, security, installation and support.
- ✔ **Computer networks.** These are now pervasive and require people to support and improve them. There are now many public operators in New Zealand, from international telecommunications carriers to local Internet service providers. In addition many organisations run their own networks within their premises, between their sites and to their partners. Careers include network design, network installation and support, wireless system design and installation, network security, performance test and measurement and network application development.

Background required

Our first year papers do not require any previous experience with programming, although prior familiarity with computers is helpful. Since you will study Intro to Algebra, Intro to Calculus, and Intro to Statistics, you will need a reasonable mathematics result with either Calculus or Statistics at NCEA Level 3 (or its equivalent).

