Computer Science
Opens Doors to Your Future

"I really hadn't expected it, but the computer science papers I did turned out to be most interesting. Solving otherwise insoluble problems using sophisticated technology is a real buzz."

Dave Ferguson BSc(Hons) Otago,
PhD Carnegie Mellon
Robotics Researcher at Google

Study Computer Science at Otago and open doors to your future - computer animation, computer games, software design and robotics, through to legal, financial and business careers.

Computer science forms the basis for all information technology and it is a fast changing and rapidly growing field, central to our modern society. Computer scientists analyse, design and implement computer algorithms and computer systems. Their skills are desperately needed in New Zealand and world-wide.

At Otago, we cover all core areas of computer science, and actively research at the cutting edge in areas such as artificial intelligence, computer graphics and vision, distributed computing, databases, search, and theory.

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Why study Computer Science?

Computer scientists are in demand across the world and attract excellent salaries. Technologies change rapidly and there is always something new and exciting to learn – whether as a programmer, software engineer, systems architect or chief technical officer. A career as a computer scientist is challenging and rewarding. If you like solving problems, then a major in computer science is for you. It is hard to describe the joy involved in designing and implementing a complex system and then seeing it all work in front of your eyes.

A minor in computer science is an invaluable supplement to any degree, whether in science, health science, business or the humanities. Technical expertise in computing in addition to expertise in another field opens doors to many exciting careers. It will change the way you think about your chosen field and make you more effective in that field.

Choosing computer science papers as electives will open doors in your mind to the possibilities of computers, will make you much more effective at using computers, and will look great on your C.V.

Background

There are no special requirements or pre-requisites, but taking Digital Technology for NCEA is useful. For students wishing to major in Computer Science, NCEA Level 3 Mathematics (preferably calculus) would be helpful.

Career opportunities

There is currently a worldwide shortage of IT professionals and they are in high demand in NZ, Australia, USA and the UK. The Information and Communications Technology section of seek.co.nz consistently has more advertised vacancies than any other category.

You will find Otago Computer Science graduates at work worldwide in every aspect of commerce, government, education, research and media in a variety of interesting roles: programmers, software engineers, systems analysts, network managers, consultants and advisors, web programmers and designers and database administrators.

Recent graduates have gone on to these careers: making CGI movies, developing the software for driverless vehicles, writing the control software for Formula 1 racing cars, designing computer games, programming the latest high performance computers, or working in medical informatics, as an entrepreneur, as a Weapons Engineering Officer in the Navy, as a database analyst, as a patent attorney.

Specialising in Computer Science

You can choose to study Computer Science in an Arts or a Science environment. You would choose a BA (or BA Hons) if you want to include subjects like Classics, Geography, History, various languages, Music, or Philosophy. You would choose a BSc (or BSc Hons) if you also want to study Biology, Biochemistry, Chemistry, Electronics, Geology, Mathematics, Physics, or Psychology.

These are the papers required for a major in Computer Science – for a BA or a BSc degree:

At 100-level

COMP 160 General Programming
plus ENGL 127, BSNS 106 plus one paper having a mathematical flavour. (COMP 150 Practical Programming is recommended as good preparation for COMP 160)

COMP 150 Practical Programming
This paper gives a gentle introduction to programming in a language called Python, which was designed to be easy to use. Python is increasingly popular for scientific and business applications. This paper is not only a good way to prepare for COMP160 but also delivers the basics of programming if you don't plan to major in Computer Science.

COMP 160 General Programming
This carefully designed paper allows a swift introduction to programming in Java, an object-oriented language. In addition to the basics, students are introduced to graphical applications. COMP 160 provides the basis for all subsequent papers in Computer Science. Although COMP 160 has no prerequisite, it is a relatively fast-moving paper, and students may gain confidence by doing COMP 150 as preparation.

COMP 112 Web Development and Digital Media
For those attracted by the creative possibilities of web development, COMP 112 will provide the knowledge and practical skills to make design concepts a reality. While COMP 112 expects that students have used a computer before, it is not an advanced course, and is suitable for students not majoring in Computer Science. It provides the foundation for our advanced web development course, COSC 212.

At 200-level

COSC 241 Programming and Problem Solving

COSC 242 Algorithms and Data Structures

COSC 243 Computer Architecture and Operating Systems

COSC 244 Data-communications, Networks and the Internet

At 300-level

COSC 326 Effective Programming

and three of

COSC 341 Theory of Computing

COSC 342 Computer Graphics

COSC 343 Artificial Intelligence

COSC 344 Database Theory and Applications

COSC 345 Software Engineering

COSC 346 Object-Oriented Programming and User Interfaces

TELE 301 Network Management

The papers required for a minor in Computer Science are listed in the *Guide to Enrolment*.

PROFILE George Phillips

George completed his BSc in Computer Science in 2012, and since then he's been building a hugely successful business called CloudCannon. Sound good? Read on!

George grew up in Dunedin, studied web design at school and had always tinkered with computing, so studying Computer Science at Otago wasn't that much of a leap.

"Computer Science at Otago has a really strong reputation, my brother had studied here so I already knew people in the department, I had lots of friends here - it was an easy decision"

George and a friend worked on a project all through their studies, building a CMS and using it to develop websites for people to earn some money.

"Because we had this project, everything we learned could be applied immediately, and that really made the learning stick. I'd recommend anyone studying to have a project they're working on; it makes you apply the concepts and understand things".

After his studies George picked up an internship with IGTIMI. He worked there for 18 months before deciding to further his personal ambitions.

George and his cofounder decided to rewrite their CMS so that it would plug into other tools and almost be magical in the way it worked. Thus CloudCannon was born. They had a small following from local tech events and online communities like Reddit. One day, out of the blue, CloudCannon was reviewed in Tech Crunch which led to thousands of users internationally. In the next year CloudCannon raised capital and doubled its team size.

"CloudCannon started as a Dropbox connected CMS that works entirely from the developers' HTML. A developer can put their content into Dropbox, and we will apply the CMS to it.."

"Computer Science at Otago taught me the wide base of knowledge that is required to be a great developer. From building games to programming robots, I enjoyed every bit of the course. Computer knowledge is incredibly important in any field, I would recommend Computer Science to anyone not just developers."

For questions about
Computer Science
otago.ac.nz/computerscience