Computer Science

Postgraduate Handbook 2018

THE UNIVERSITY OF
AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

SCIENCE
DEPARTMENT OF
COMPUTER SCIENCE

Welcome to the Department of Computer Science

I am thrilled that you are contemplating postgraduate study in our department. Computer scientists are shaping the future of our society and you will have the skills to be part of that. We offer a wide range of options for postgraduate study, which will suit whatever pathway you are planning in your career.

By joining our successful department, you'll discover the passion and excitement that drives us to stay at the forefront of research in the discipline. Industry, both internationally and here in New Zealand, values the depth of knowledge and research abilities that you will gain in postgraduate study at the University of Auckland. I look forward to seeing you progress, and watching as you shape our future.
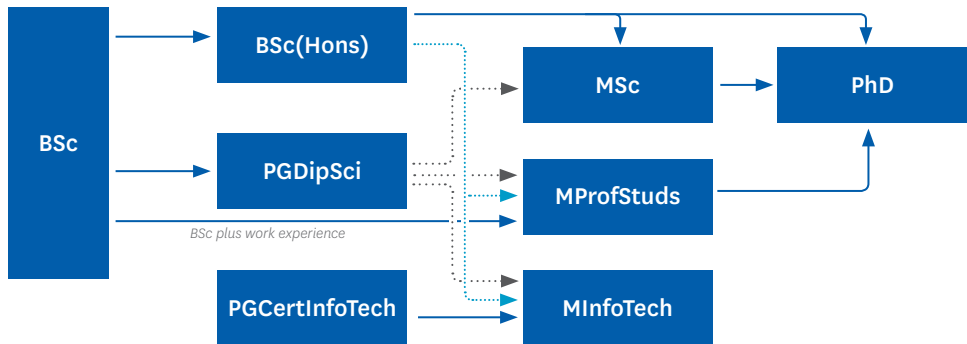
Professor Robert Amor
Head of Department

Our subject is ranked in the top 100 worldwide

QS World University Rankings by subject 2017

TOP
100
in the world

Computer Science

Postgraduate study options in Computer Science

Flowchart:

- **BSc** → **BSc(Hons)**
- **BSc** → **PGDipSci**
- **BSc** → *BSc plus work experience* → **MProfStuds**
- **PGCertInfoTech**
- **BSc(Hons)** → **MSc** → **PhD**
- **BSc(Hons)** → **PhD**
- **PGDipSci** → **MSc** / **MProfStuds**
- **PGCertInfoTech** → **MInfoTech**
- **MProfStuds** → **PhD**

Postgraduate Certificate in Information Technology (PGCertInfoTech)

The Postgraduate Certificate in Information Technology (PGCertInfoTech) has been designed to allow students with undergraduate qualifications in areas other than IT to gain functional IT skills.

Graduates of the PGCertInfoTech can gain entry to related masters-level programmes or to entry-level workplace positions. Students will gain fundamental skills in software development, including object-oriented programming and design, web technologies and databases. It can be regarded as the preparatory step for a Master of Information Technology.

Prerequisite

Students must have completed the requirements for a suitable bachelors degree from the University of Auckland or an equivalent degree qualification, with a GPA of at least 4.0.

Structure

The Postgraduate Certificate in Information Technology is a 60-point taught programme.

Students take highly practical, hands-on and lab-based courses that are exclusive to the programme.

Duration

Full-time programme taken over one semester.

Late-year semester (November to February),

Semester One and Semester Two.

Part-time in Semester One and Two.

Contact

ict@auckland.ac.nz

Bachelor of Science (Honours) (BSc(Hons)) in Computer Science

BSc(Hons) is our premier degree for students who want to understand the frontiers of Computer Science. After graduating with your BSc(Hons), it is possible to progress to a masters degree (MSc); students gaining First or Second Class Division One honours may be eligible for direct entry to a doctorate (PhD).

Prerequisite

A Bachelor of Science with at least 90 points at Stage III or above. You will need a GPA of 5.0 or higher in 45 points at Stage III or above in your intended specialisation.

Structure

All honours students must complete at least 60 points from COMPSCI 701-717, 720-777 and BIOINF 702, and up to 30 points from 700-level courses in a related subject with approval of the Head of Department. Students must also complete a 30-point COMPSCI 789 dissertation.

Duration

One year full-time or two years part-time from initial enrolment

Contact

HonoursCoordinator@cs.auckland.ac.nz

Postgraduate Diploma in Science (PGDipSci) in Computer Science

PGDipSci develops cutting-edge skills in Computer Science. It is designed for students who have a BSc with a major in Computer Science. It can be regarded as the preparatory year for a masters degree in Computer Science.

Prerequisite

A completed BSc with a major in Computer Science

Structure

Students must complete at least 90 points from COMPSCI 601, 602, 691, 701-717, 720-780 and BIOINF 702. Up to 30 points from 700-level courses in a related subject may be chosen, with approval of the Head of Department.

Duration

One year full-time or up to four years part-time from initial enrolment

Contact

diploma@cs.auckland.ac.nz

Master of Science (MSc) in Computer Science

MSc is a one-year research programme by thesis only. This is our core programme designed to develop research skills in Computer Science.

Prerequisite

Applicants for the MSc programme must have completed a BSc(Hons) or a PGDipSci in Computer Science from the University of Auckland (or equivalent), with a GPA of at least 4.0 in 90 points.

Structure

Research. You will be directed and supported by an appointed supervisor while engaged in your independent research study. The results of the research you carry out over the period of registration will be submitted as a thesis.

Duration

One year full-time or two years part-time from initial enrolment

Contact

MScCoordinator@cs.auckland.ac.nz

Master of Professional Studies (MProfStuds)

The department offers two professional masters degrees: Data Science and Digital Security. These taught masters programmes have been designed in response to demand from industry.

Prerequisite

In order to be admitted to either of these programmes, a student needs to have completed:

Either

- The requirements for a four-year bachelors degree

Or

- The requirements for a bachelors (honours) degree

Or

- The requirements for a bachelors degree

And

- Have a GPA of at least 4.0 in 90 points (or equivalent) of the most advanced courses of the degree

And

- Either a professional qualification equivalent to one year's advanced study or at least three years of professional experience in a field similar to your intended specialisation

And

- Any prerequisites for the courses in the specialisation in which they wish to enrol

Applicants who do not have the background to take the core 700-level Computer Science courses should first take some relevant Computer Science courses as part of a Certificate of Proficiency programme.
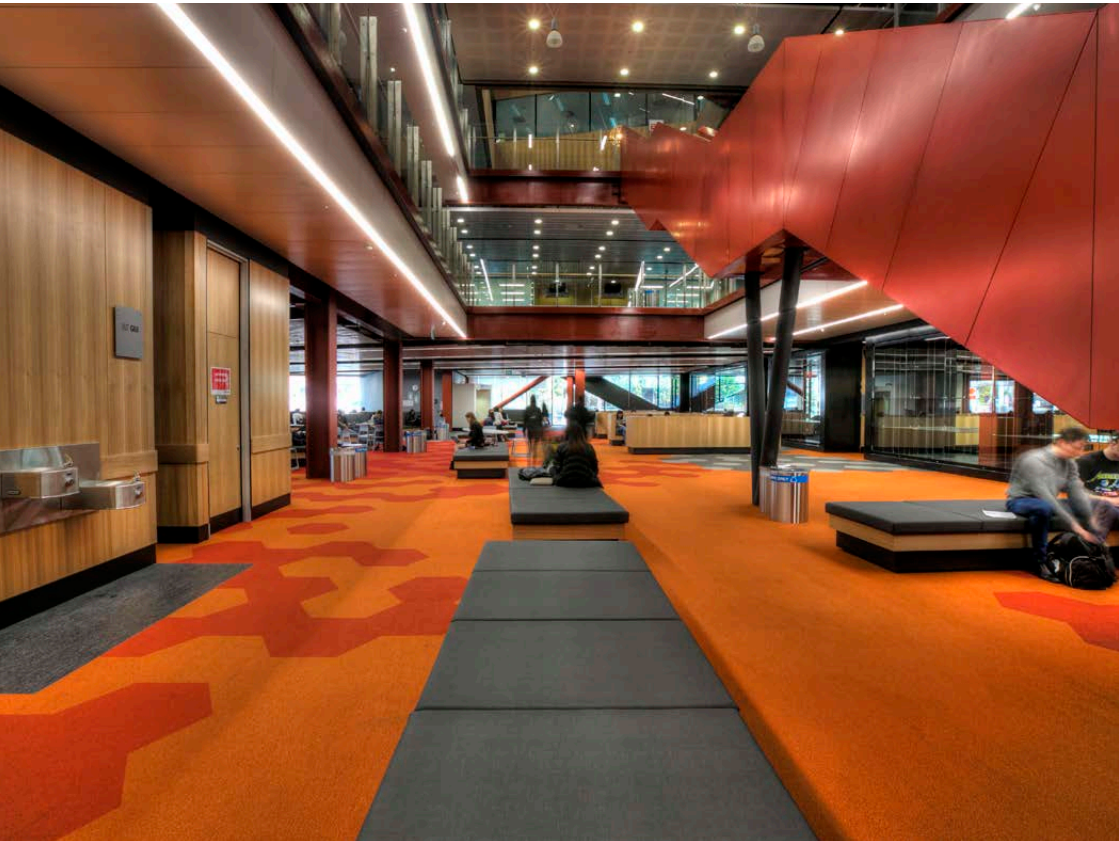
MProfStuds in Data Science

This programme will give graduates a unique combination of skills in data science and data management. These skills will enable them to comprehend, process and manage data efficiently, to extract value from data in order to visualise and communicate it effectively.

Structure

- At least 30 points from COMPSCI 751, 752, 753, 760

- At least 30 points from STATS 762, 769, 782, 784

- Up to 30 points from courses relevant to the area of study from SCIENT 701, 702, COMPSCI 705, 711, 720, 732, 734, INFOSYS 720, 722, 726, 727, 737, 740, OPSMGT 760, 762, 764, STATS 707, 779, 783

- 30 points from COMPSCI 791 Dissertation

Applicants who do not have the background to take the core 700-level Statistics courses should also first take some relevant Statistics courses as part of a Certificate of Proficiency programme. For example, STATS 201 Data Analysis or STATS 207 Data-Centred Investigation and Analysis.

Duration

One year full-time or four years part-time from initial enrolment

Contact

mprofstuds@cs.auckland.ac.nz

MProfStuds in Digital Security

The Digital Security specialisation brings together courses from Computer Science, Information Systems and Operations Management. The programme addresses a need for professionals who are capable of implementing appropriate security strategies, who take into account law and business constraints, who understand and master tools for implementing security policies, and who are able to take containment actions during and after a breach has occurred.

Structure

- 60 points from COMPSCI 725, 726, 727, INFOSYS 727

- 30 points from COMPSCI 702, 705, 720, 732, 742, INFOSYS 720, 726, 730, 737, 750, 751

- 30 points from COMPSCI 791 Dissertation

Duration

One year full-time or four years part-time from initial enrolment

Contact

mprofstuds@cs.auckland.ac.nz

Master of Information Technology (MInfoTech)

The Master of Information Technology is a taught masters programme, with a 60-point industry internship. It is open to students with a background in an IT-related field. It can be taken full-time or part-time.

Prerequisites

180-point option

A relevant bachelors degree (or approved equivalent) with a GPA of at least 4.5 in 75 points at or above Stage III, including at least 45 points in an IT-related field; OR the Postgraduate Certificate in Information Technology (PGCertInfoTech) with a GPA of at least 4.5.

120-point, 'fast track' option

A relevant bachelors (honours) degree (or approved equivalent) with a GPA of at least 4.5 in 75 points above Stage III, including at least 45 points at 700-level in an IT-related field.

Structure

The Master of Information Technology is a taught masters programme, with a 60-point industry internship.

Duration

One year full-time or two years part-time from initial enrolment

Contact

ict@auckland.ac.nz

Doctor of Philosophy (PhD)

The Computer Science doctoral programme is a research degree that enables exceptional students to become experts in their areas of interest through original and creative research. The degree prepares students for careers at the forefront of academia, government and industry. It is the highest level qualification that can be awarded by the University of Auckland, and as such the application process is rigorous.

Prerequisite

Ideally, candidates will have completed a masters degree to a high standard or a first class honours degree, and demonstrate an ability to produce doctoral-level research. Other high-level degrees may also be acceptable.

Structure

Research. You will be directed and supported by an appointed supervisor while engaged in your independent research study. The results of the research you carry out over the period of registration will be submitted as a thesis.
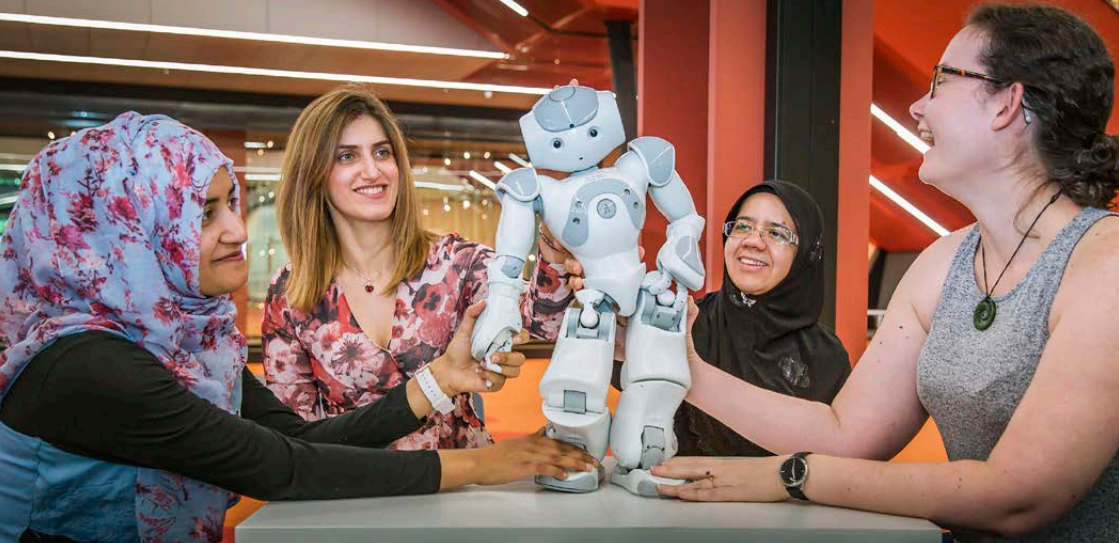
Duration

Three to four years full-time or six to eight years part-time.

Contact

phdcoordinator@cs.auckland.ac.nz

For more information, go to
www.science.auckland.ac.nz/phd

Postgraduate Computer Science Courses

Course code	Title
COMPSCI 702	Security for Smart-devices
COMPSCI 705	Advanced Topics in Human Computer Interaction
COMPSCI 711	Parallel and Distributed Computing
COMPSCI 715	Advanced Computer Graphics
COMPSCI 720	Advanced Design and Analysis of Algorithms
COMPSCI 725	System Security
COMPSCI 726	Network Defence and Countermeasures
COMPSCI 727	Cryptographic Management
COMPSCI 732	Software Tools and Techniques
COMPSCI 734	Web, Mobile and Enterprise Computing
COMPSCI 742	Advanced Internet: Global Data Communications
COMPSCI 747	Computing Education
COMPSCI 750	Computational Complexity
COMPSCI 751	Advanced Topics in Database Systems
COMPSCI 752	Web Data Management
COMPSCI 753	Uncertainty in Data
COMPSCI 760	Data-mining and Machine Learning
COMPSCI 761	Advanced Topics in Artificial Intelligence
COMPSCI 765	Interactive Cognitive Systems
COMPSCI 767	Intelligent Software Agents
COMPSCI 771	Advanced Topics in Computer Graphics and Image Processing
COMPSCI 773	Intelligent Vision Systems
BIOINF 702	Comparative Bioinformatics
BIOINF 703	Genome Bioinformatics and Systems Biology
BIOINF 704	Statistical Bioinformatics

Careers in Computer Science

Recent developments in digital technology have meant that computers are not only a tool for corporate businesses, but are now used extensively across a range of other industries including manufacturing, transport, communication, healthcare and entertainment. With the internet changing the way we communicate and the way in which we do business, there is also an increasing need for companies to hire professional staff with computer expertise to develop and maintain their systems.

Academia

Business analyst

Computer consultant

Database/systems administrator

E-Commerce solutions architect

Educational software developer

Game developer

Geographic information systems (GIS) analyst

Information and communication technology manager

Information systems manager

Multimedia programmer

Network engineer

Programmer

Project manager

Robotics engineer

Software architect

Software engineer

Systems analyst

Systems developer

Telecommunications engineer

Test analyst

UX developer

Web developer

"I completed a research project in the course COMPSCI 747 (Computing Education) called 'Computing for social good'. The topic itself was very interesting and my lecturer was an expert in the field of computer science education.

"All these facts combined made me want to continue onto masters with the same research topic. My masters thesis is entitled 'Making computer science more socially relevant'.

"Computing education discusses various aspects of how to teach computer science in a more effective manner. One of the angles that I'm looking at is the lack of gender diversity within the field, and how to attract more females.

"With the substantial growth and usage of technology, it seems only appropriate that females should actively be a part of the creation process as well. My proposed idea is that if computer science can be illustrated as a more socially relevant discipline, with application to the real world and other subjects, it may attract and retain more females.

"When I finish my masters I hope to get a good job and build my career. I've found the University's Career Development and Employability Service (CDES) and Libraries and Learning Services to be very helpful and motivating.

"Academic writing and preparing for the work industry is much easier when such effective guidance is provided for students.

"During postgrad study, I feel like there are so many great opportunities to nurture lifelong friendships with lecturers, tutors and supervisors. We can connect on a whole new level, instead of just a teacher-student type of relationship. This allows us to expand our learning and be aware of the ongoing advancements within our field. Being part of the Human Computer Interaction research group was a complete treat, as it provided continuous support and feedback."

Nazish Zaman Khan *is studying for a Master of Science specialising in Computer Science.*

Helpful information

Academic dates
www.auckland.ac.nz/dates

Accommodation
www.accommodation.auckland.ac.nz

Apply for postgraduate study
www.auckland.ac.nz/applynow

Career Development and Employment Services
www.cdes.auckland.ac.nz

Childcare
www.auckland.ac.nz/childcare

Course advice and degree planning in Science
www.science.auckland.ac.nz/student-centre

Disability Services
www.disability.auckland.ac.nz

How to enrol
www.auckland.ac.nz/enrolment

Information for postgraduate students
www.postgraduate.ac.nz

International students
www.international.auckland.ac.nz

Libraries and Learning Services
www.library.auckland.ac.nz

Māori and Pacific students
www.science.auckland.ac.nz/tuakana

Need help?
www.askauckland.ac.nz

Postgraduate Students' Association
www.pgsa.org.nz

Rainbow Science Network for LGBTI students
www.science.auckland.ac.nz/rainbowscience

Scholarships and awards
www.scholarships.auckland.ac.nz
www.auckland.ac.nz/fees

Support for students
www.science.auckland.ac.nz/support

> *Questions about computer science?*
> *pgscience@auckland.ac.nz*

Disclaimer
Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to alteration. All students enrolling at the University of Auckland must consult its official document, the University of Auckland Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies.

THE UNIVERSITY OF
AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
N E W   Z E A L A N D

Connect with us

Faculty of Science, The University of Auckland
Private Bag 92019, Auckland 1142, New Zealand

Phone: 0800 61 62 63 | Email: scifac@auckland.ac.nz
Web: www.cs.auckland.ac.nz

twitter.com/ScienceUoA

www.facebook.com/science.uoa