LOGIC AND COMPUTATION

UNDERGRADUATE HANDBOOK

2017

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

SCIENCE

Welcome to Logic and Computation

Studying a major in Logic and Computation means learning from multi-disciplinary experts in the Faculty of Arts and Sciences. Logic is the focal point that allows you to investigate philosophical concepts and theoretical mathematics while learning concrete applications in computer science and linguistics.

Logic and Computation provides the link between theoretical thinking and real-world problems. You will acquire analytic and critical tools to investigate complex problems. Depending on the career you choose, you will learn the practical and theoretical skills that employers value, and gain a strong foundation for further multi-disciplinary research in Arts or Science.

We are very proud that you chose to join the most comprehensive programme in Logic and Computation in Australasia, and we are excited to welcome you to the team.

PATRICK GIRARD, Senior Lecturer,
JEREMY SELIGMAN, Senior Lecturer and
ANDRÉ NIES, Professor

Bachelor of Science in Logic and Computation

Logic and Computation is about symbolic systems used by humans and computers. It applies ideas and techniques from Computer Science, Philosophy, Mathematics and Linguistics to relate the structure of symbolic representation in human thought and computer software.

Logic and Computation is offered as a major of both the Bachelor of Science degree and the Bachelor of Arts degree. It is possible to take this specialisation to Honours, Postgraduate Diploma and Masters levels in both Science and Arts.

3 The average number of years it takes to complete a Bachelor of Science degree

You can choose either a single or double major

Single | Double

Preparation for school leavers

Students are not required to have studied any sort of computing at high school. However, it would be beneficial to study NCEA Level 3 in Mathematics, Physics or equivalent. For more information, go to **www.science.auckland.ac.nz/subject-guide.**

For course planning and enrolment, go to **www.science.auckland.ac.nz/student-centre**

Thinking about postgraduate study options? **Visit www.cs.auckland.ac.nz/pg**

www.science.auckland.ac.nz/ logic-and-computation

Complementary majors

You may wish to consider a double major to gain a broader base of skills and knowledge.
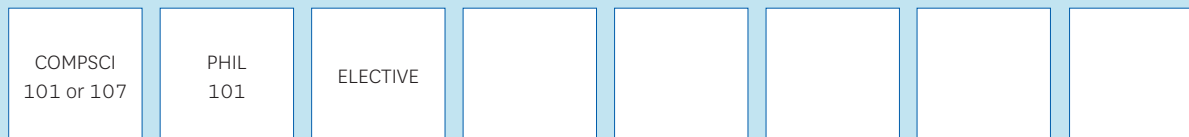
LOGIC AND COMPUTATION +

Applied Mathematics
Computer Science
Information Systems
Mathematics
Physics
Statistics

www.science.auckland.ac.nz/doublemajors

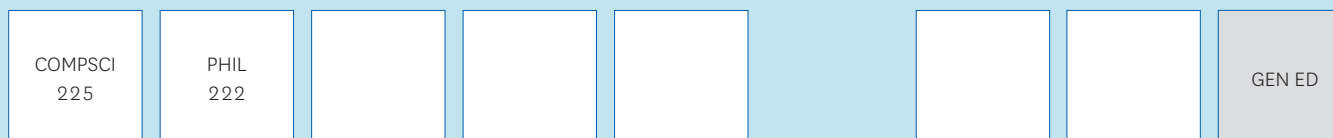# Planning your Logic and Computation major

BSc

Year 1

| COMPSCI 101 or 107 | PHIL 101 | ELECTIVE | | | | | |

With appropriate prerequisites can also be filled by Stage II or III.

Elective:
COMPSCI 105, 220, 320, 350, 367
LINGUIST 100, 103, 200, 300, 313, 320
LOGICOMP 201, 301, 302
MATHS 150, 250, 253, 255, 315, 326, 328
PHIL 105, 216, 266, 305, 315, 323

Year 2

| COMPSCI 225 | PHIL 222 | | | | | | GEN ED |

Stage II   Any Stage

Note:
1. Stage II COMPSCI courses require a GPA of 2.0 or higher.
2. COMPSCI 220 requires 15 points from MATHS 108, 110, 150 or 153.

Year 3

| YEAR III CORE | YEAR III CORE | YEAR III CORE | YEAR III CORE | | | | GEN ED |

Stage III Science   Stage II or III Science

Year III CORE: COMPSCI 320, 350, 367, LINGUIST 300, 313, 320, LOGICOMP 301, 302, MATHS 315, 326, 328, PHIL 305, 315, 323

1. Courses in a minimum of three subjects listed in the BSc Schedule.

2. At least 180 points (12 courses) must be above Stage 1.

3. Up to 30 points (2 courses) may be taken from outside the Faculty.

4. 30 points (2 courses) must be taken from the appropriate General Education Schedules for BSc students.

5. At least 75 points (5 courses) must be at Stage III, of which 60 points (4 courses) must be in the majoring subject.

To view regulations for majors, and course descriptions, see www.calendar.auckland.ac.nz

BSc degree requires: 360 points (24 x 15 point courses). Each box represents one 15 point course.

It is recommended that students enrol in 8 courses each year.

Degree Planners for double majors can be found at www.science.auckland.ac.nz/course-planning

Undergraduate Logic and Computation courses

A major in Logic and Computation is a coherent group of related courses from Computer Science, Philosophy, Mathematics and Linguistics. Logic and Computation courses give you a sound practical knowledge of programming and conceptual analysis needed for deeper theoretical understanding of the subjects. Listed below are the courses in the Logic and Computation major and can be taken in any of the four main disciplines in the programme.

Stage I

COMPSCI 101	Principles of Programming
COMPSCI 105	Principles of Computer Science
COMPSCI 107	Computer Science Fundamentals
LINGUIST 100	Introduction to Linguistics
LINGUIST 103	Introduction to English Linguistics
MATHS 150	Advancing Mathematics 1
PHIL 101	Introduction to Logic
PHIL 105	Critical Thinking

Stage II

|	
COMPSCI 220	Algorithms and Data Structures
COMPSCI 225	Discrete Structures in Mathematics and Computer Science
LINGUIST 200	Syntax
LOGICOMP 201	Special Topic
MATHS 250	Advancing Mathematics 2
MATHS 253	Advancing Mathematics 3
MATHS 255	Principles of Mathematics
PHIL 216	Modal Logic
PHIL 222	Intermediate Logic
PHIL 266	Games, Rationality and Choice

Stage III

COMPSCI 320	Applied Algorithmics
COMPSCI 350	Mathematical Foundations of Computer Science
COMPSCI 367	Artificial Intelligence
LINGUIST 300	Syntax: Function and Typology
LINGUIST 313	Lexical Functional Grammar
LINGUIST 320	Topics in Pragmatics
LOGICOMP 301	Philosophy and Computation
LOGICOMP 302	Special Topic
MATHS 315	Mathematical Logic
MATHS 326	Combinatorics
MATHS 328	Algebra and Applications
PHIL 305	Advanced Logic
PHIL 315	Topics in Applied Logic
PHIL 323	Philosophy of Logic

For course descriptions and prerequisite information, go to
www.science.auckland.ac.nz/logic-and-computation

Careers in Logic and Computation

Can you imagine life without your smartphone, your computer, or your gaming console? Computing technology is everywhere in everyday life. Every industry is becoming more and more dependent on computing technology and the market for experts in that field continues to expand and diversify. Graduates who are adaptable and who have demonstrated skills in computing, analytical thinking and communication will always be in demand. The Logic and Computation programme can provide students with programming knowledge, problem solving, communication skills and the logical and critical thinking skills that are highly-valued and sought-after in the marketplace.
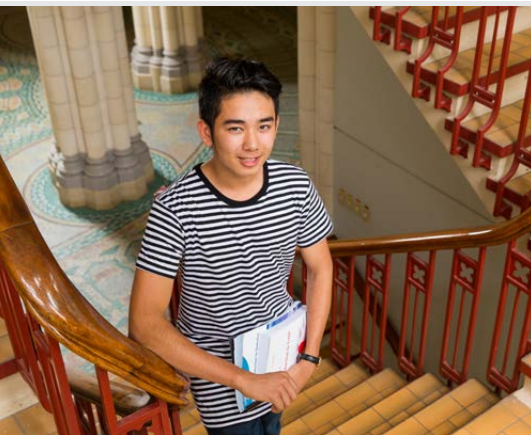
"I chose to study Logic and Computation because it seemed appropriate for the rapidly growing technological era that we are now in. I have always been inherently curious, and eager to learn about things like 'Siri' in the iPhone – and this is the perfect major to understand how the back end of voice command programmes like Siri and those in GPS systems work.

"Once I finish my degree, my goal is to move into a digital marketing and programming role in an innovative organisation. I believe that studying Logic and Computation will help to make that happen."

Asim Mughal *is studying toward a BSc/BCom conjoint degree majoring in Logic and Computation, Computer Science, Marketing and International Business.*

Careers
Analyst/Programmer
Application Developer/Programmer
Behaviour Engineer
Business Systems Manager
Computer Assisted Assessment Developer
Computer Coder
Developer
ESRI Intermediate Developer
GIS Technician/Planning Assistant
ICT Technician
IT Analyst
IT/Communications Executive
Junior Test Analyst
Lab Technician
Net Developer
Network Administrator
Senior Applications Engineer
Senior SQL Developer
Software Analyst Software Development
Software Developer
Software Engineer
Technical Analyst
Technician
User Interface Developer

Helpful information

Academic dates	www.auckland.ac.nz/dates
Academic Integrity Course	www.auckland.ac.nz/academic-integrity
Accommodation	www.accommodation.auckland.ac.nz
Coursebooks can be purchased at UBS	www.ubsbooks.co.nz
Career Development and Employment Services	www.auckland.ac.nz/careers
Course advice and degree planning in Science	www.science.auckland.ac.nz/student-centre
General education	www.auckland.ac.nz/generaleducation
How to apply	www.apply.auckland.ac.nz
How to enrol	www.auckland.ac.nz/enrolment
International students	www.international.auckland.ac.nz
Māori and Pacific students	www.science.auckland.ac.nz/tuakana
Need help?	www.askauckland.ac.nz
Rainbow Science Network for LGBTI students	www.science.auckland.ac.nz/rainbowscience
Scholarships and awards	www.scholarships.auckland.ac.nz
Support for students	www.science.auckland.ac.nz/support

Applications close on December 8.

Questions about Logic and Computation? Email logic@auckland.ac.nz