

Stage III courses

To major in Computer Science, you have to take four Stage III COMPSCI courses, plus one other Stage III course chosen from the BSc Schedule. This may be another Stage III COMPSCI course.

Note: If you would like to take the Bachelor of Science (Honours) after you have completed your BSc, you will need at least a B average in at least six Stage III courses. Only three of these have to be Stage III COMPSCI courses.

COMPSCI 313

S2 C

Computer Organisation

This course investigates modern processor architectures. Principles of modern processor design, pipelining, memory hierarchies, I/O and network interfacing will also be covered, as will the topics of compiler and OS support, embedded processors, performance and multiprocessing.

Prerequisites COMPSCI 210 and 215 and (PHYSICS 140 or 243)

Restriction SOFTENG 363 and COMPSYS 304

Assessment 20% assignments, 10% test, 70% exam

Coordinator Associate Professor John Morris

Required Text Patterson, D. A. & Hennessy, J. L. (2005). Computer Organization & Design: The Hardware/Software Interface (3rd Ed). Morgan Kaufmann.

Note Taught concurrently with SOFTENG 363 and COMPSYS 304

Important You must pass the practical and the theory (written) sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci313s2c

COMPSCI 314

S2 C

Modern Data Communications

This course introduces the principles of data communications and networks, including the Internet, and covers all levels of the communications architecture. You begin with the layered protocol model, data transmission and coding. You will be introduced to the full range of basic networking protocols: link-level and local area networks, wide-area internetworking, routing, transport and security. Basic application protocols that act as the foundation for distributed computing will be discussed. You will end the course with a full overview of how networks, especially the Internet, fit together.

Prerequisites COMPSCI 210 and (COMPSCI 215 or INFOSYS 224)

Restriction SOFTENG 364

Assessment 15% assignments, 15% test, 70% exam

Required Text Shay, W. A. (2004) Understanding Data Communications and Networks (3rd Ed)

Important You must pass the practical and the theory (written) sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci314s2c

COMPSCI 320
Applied Algorithmics

S2 C

This course explores fundamental design techniques for efficient algorithmic problem-solving and software development. Design methods such as greedy approach, divide-and-conquer, dynamic programming and exhaustive search are applied for many real-world problems to yield solutions that are both correct and efficient. Coping strategies will be briefly introduced. You will cover several case studies for algorithmics in such areas as optimally scheduling events, how to pack knapsacks, routing algorithms in networks and data compression.

Prerequisites COMPSCI 220 and 225

Assessment 15% written assignments, 15% programming assignments, 10% test, 60% exam

Required Text J. Kleinberg and E. Tardos: Algorithm Design, (Addison Wesley 2006)

Important You must pass the practical and the theory sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci320s2c



COMPSCI 335
Distributed Objects, Services, and Programming

S2 C

This course is a programming introduction to distributed services and to browser-based applications. Functional programming for data integration will also be explored. Specific topics will include simple distributed applications, using message-based, declarative or functional programming methods, concepts of programming with XML, SOAP and HTTP based mechanisms, and programming for dynamic web content generation.

Prerequisites COMPSCI 230 and one other Stage II COMPSCI course

Assessment 20% assignments, 20% test, 60% exam

Coordinators Dr Radu Nicolescu, Dr S Manoharan

Important You must pass the practical (assignments) and the theory (test and exam) sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci335s2c

COMPSCI 340
Operating Systems

S2 C

Operating Systems are taken for granted by almost everyone who uses a computer, however a clear understanding of them makes you a better programmer and program designer. If you don't know what is beneath the surface you can't think clearly about things such as efficiency and scalability. The major topics of Operating Systems continue to develop as our concept of the computer changes. This course focuses on desktop Operating Systems but stretches up to distributed computing on the Web and down to embedded devices. Some of the fastest growing areas of computing are included in this course, such as virtualisation and parallel programming.

Prerequisites COMPSCI 215 and 230

Restriction SOFTENG 370

Assessment 20% assignments, 10% test, 70% exam

Coordinator Dr Robert Sheehan

Note Taught concurrently with SOFTENG 370

Important You must pass the practical (assignments) and the theory (test and exam) sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci340s2c

COMPSCI 345
Human-Computer Interaction

S1 C

This course provides an introduction to Human Computer Interaction examining human behaviour and expectations, computer interfaces and the interaction between the two. As approximately half of the development effort in typical systems is related to the user interface, the role of interface design and user centred design is emphasised throughout the course. Usability evaluation techniques for web and standard interfaces are explained and practised. You will survey a selection of advanced HCI topics, for example informal interfaces, collaborative interfaces, visualisation tools, accessibility, mobile computing, or multi-modal interfaces.

Prerequisites COMPSCI 230 or SOFTENG 206

Restriction COMPSCI 370 and SOFTENG 350

Assessment 20% assignments, 15% test, 65% exam

Coordinators Dr Beryl Plimmer, Associate Professor Robert Amor

Note Taught concurrently with SOFTENG 350

Important You must pass the practical (assignments) and the theory (test and exam) sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci345s1c

Mathematical Foundations of Computer Science

The aim of this course is to present mathematical models for programming languages and computation, and derive results about what can and cannot be computed. Abstract programming languages (finite automata, context-free grammars, Turing and register machines) are studied. Basic concepts for programming languages, limits on computational power and algorithmic complexity are also presented. The Church-Turing thesis and quantum computing are briefly and critically discussed.

Prerequisites COMPSCI 225 and (COMPSCI 220 or PHIL 222)

Assessment 20% assignments, 30% test, 50% exam

Required Text Sipser, M. (1997). Introduction to the Theory of Computation. Boston: PWS Publishing Comp.

Recommended text Calude, C.S. & Paun, G. (2001). Computing with Cells and Atoms. London: Taylor and Francis Publishers.

Web www.cs.auckland.ac.nz/courses/compsci350s1c

Fundamentals of Database Systems

Databases are at the core of most modern software applications. In this course you will learn the foundations of database systems, enabling you to build effective and efficient database applications. The course is divided into two parts: the first teaches you how to design and program a database application and the second looks in depth at how database systems are built to work in the current changing environment. In particular, it considers how consistency is maintained across a database when something breaks, how security of the data can be ensured, and what influence the Internet has had on database systems.

Prerequisites COMPSCI 220 and 225

Restriction SOFTENG 351

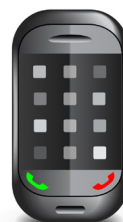
Assessment 20% assignments, 20% test, 60% exam

Coordinator Dr Gerald Weber

Note Taught concurrently with SOFTENG 351

Important You must pass the practical and the theory sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci351s1c



COMPSCI 367 Artificial Intelligence

S2 C

In this course, you will cover the representation, utilisation, and acquisition of knowledge. These are the cornerstones of AI. You will investigate how to take a real world problem and represent it in a computer, so that the computer can do inference. Utilising this knowledge, or acquiring new knowledge, is done by search. The basics of search and its use in planning will be covered. Machine learning will be covered, including the difference between induction and deduction and the similarities between machine learning and optimisation.

Prerequisites COMPSCI 220 and 225

Restriction COMPSCI 365 and 366

Assessment 30% assignments, 10% test, 60% exam

Required Text Russell, S.J. & Norvig, P. (2002.). Artificial Intelligence: A Modern Approach (2nd Ed). Upper Saddle River, New Jersey: Prentice Hall.

Recommended text Giarratano, J. C. (1998.). Expert Systems: Principles and Programming. Boston: PWS Pub Co.

Important You must pass the practical and the theory sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci367s2c

COMPSCI 369 Computational Science

S1 C

Computational science is the development and application of computer algorithms and software to solve scientific and engineering problems, such as probabilistic computer modelling, computer-based statistical inference and computer simulation. Opportunities are provided in this course to focus particularly on Computational Biology or Computational Engineering. These will be taught in separate streams. Please note this when enrolling.

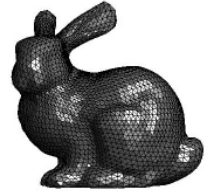
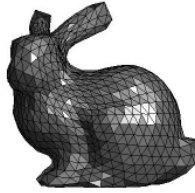
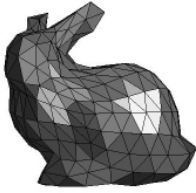
Prerequisites COMPSCI 220 and 15 points from STATS 101 - 125

Assessment 30% assignments, 70% exam

Important You must pass the practical and the theory sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci369s1c





COMPSCI 373 Computer Graphics and Image Processing

S1 C

This course introduces the fundamentals of image processing and computer graphics, which are necessary for the analysis and processing of image data and for the reconstruction, modelling, animation and photo-realistic rendering of 3-D. You will learn key computer graphics concepts including graphics primitives, lighting and shading, texture mapping, ray tracing, character animation and curve and surface design. In addition, image processing fundamentals are presented such as image definition and representation, perception and colour models, grey level and colour enhancement, neighbourhood operations and filtering. Basic geometric processes for image analysis and scene formation will be discussed including transformations, viewing and projection, and digital geometry.

Prerequisites COMPSCI 210 and 230

Restriction COMPSCI 372 and 375

Assessment 20% test, 25% assignment, 55% exam

Coordinator Dr Burkhard Wuensche

Important You must pass the practical and the theory sections separately to pass the course as a whole.

Web www.cs.auckland.ac.nz/courses/compsci373s1c

COMPSCI 380 Undergraduate Project in Computer Science

SS, S1, S2

This 15 point project is supervised, independent research or development work on a topic in Computer Science.

Required Approval of Head of Department required. Contact the Project Coordinator before enrolment at projectcoordinator@cs.auckland.ac.nz.

Restriction COMPSCI 690

Assessment 100% course work
The course work consists of a written report and two short presentations.

Supervisor Students must find a staff member to supervise the project before enrolling in this course.

Note This course is available only to BSc and GradDipSci students with excellent academic records.