

# Stage II courses

You must take at least four Stage II COMPSCI courses if you want to major in Computer Science.

Have a look at the Stage III courses you would like to do first, to ensure that you are choosing the correct Stage II prerequisites for them. Talk to our advisers if you need help planning your degree.



## COMPSCI 210 Computer Systems 1

S1 C, S2 C

This course aims to give students an understanding of how computer systems work at the lowest level seen by the programmer, namely the interface between the computer hardware and software. It also provides an understanding of how high-level language concepts are implemented at the machine level. The course covers the following material: Programming in C including the use of pointers. Data representation. The architecture of a processor. Instructions and instruction execution. Assembly language.

**Prerequisites** COMPSCI 101 and COMPSCI 105

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

**Required Text** Patt, Patel, Introduction to Computing Systems, from bits & gates to C & beyond, 2nd edition, 2004, MacGraw-Hill

**Note** It is best to enrol in COMPSCI 210 before or concurrently with COMPSCI 215.

**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/compsci210s1c](http://www.cs.auckland.ac.nz/courses/compsci210s1c)

**Students who have a B+ grade or better in COMPSCI 101 may apply for a concession to enrol in COMPSCI 210 concurrently with COMPSCI 105.**

**COMPSCI 215**  
**Computer Systems 2**

**S1 C**

This course aims to show how a usable computer system may be provided by the operating system software built on top of the computer hardware, and the hardware requirements needed to support the operating system. The course covers the following material: UNIX shell programming. The architecture/operating system interface. Virtual memory. Exception and interrupt handling. Computer security. Input/output and data communications.

<b>Prerequisites</b>	COMPSCI 101 and COMPSCI 105
<b>Recommended</b>	Prior or concurrent enrolment in COMPSCI 210
<b>Assessment</b>	20% assignments, 20% test, 60% exam
<b>Important</b>	You must pass the practical and the theory sections separately to pass the course as a whole.
<b>Web</b>	<a href="http://www.cs.auckland.ac.nz/courses/compsci215s2c">www.cs.auckland.ac.nz/courses/compsci215s2c</a>

**COMPSCI 220**  
**Algorithms and Data Structures**

**S1 C, S2 C**

This course is an introduction to the analysis of algorithms and data structures. Topics covered include: common abstract data types and their implementations; asymptotic complexity analysis; sorting and searching algorithms; depth-first and breadth-first search and applications; and graph optimization problems.

<b>Prerequisites</b>	COMPSCI 101 and 105 and one of MATHS 108 or 150 or 153
<b>Assessment</b>	25% assignments, 10% test, 65% exam
<b>Required Text</b>	Dinneen, M.J., Gimel'farb, G., and Wilson, M.C. (2nd edition, 2009) Introduction to Algorithms, Data Structures and Formal Languages. Pearson Education New Zealand.
<b>Important</b>	You must pass the practical and the theory sections separately to pass the course as a whole.
<b>Web</b>	<a href="http://www.cs.auckland.ac.nz/courses/compsci220s2c">www.cs.auckland.ac.nz/courses/compsci220s2c</a>

**COMPSCI 225**  
**Discrete Structures in Mathematics and Computer Science**

**S1 C, S2 C**

An introduction to logic, principles of counting, mathematical induction, recursion, relations and functions, graphs and trees, and algorithms. This course is suited to students who are interested in the foundations of computer science, mathematics and logic. The main themes are: proof methods, logic and induction; sets and functions; counting; discrete structures.

<b>Prerequisites</b>	15 points from COMPSCI 101, MATHS 108, 150, 153 or PHIL 101
<b>Restriction</b>	MATHS 255
<b>Assessment</b>	10% assignments, 20% test, 70% exam
<b>Recommended text</b>	Ross, K.A. & Wright, C.R. (2003). Discrete Mathematics. (5th Ed). Prentice-Hall.
<b>Web</b>	<a href="http://www.math.auckland.ac.nz/wiki/COMPSCI_225">www.math.auckland.ac.nz/wiki/COMPSCI_225</a>

**COMPSCI 230**  
**Software Construction**

**S1 C, S2 C**

Students will develop a software application of reasonable complexity through the application of established software development techniques. In doing so, students will demonstrate fundamental skills in object-oriented software development, GUI programming and application-level multithreading. In addition, students will learn established techniques to ensure that their software satisfies quality criteria.

<b>Prerequisites</b>	COMPSCI 101 and 105
<b>Assessment</b>	20% assignments, 15% test, 65% exam
<b>Required Text</b>	Lethbridge, T. & Laganier, R. (2001). Object-Oriented Software Engineering. McGraw Hill.
<b>Important</b>	You must pass the practical and the theory sections separately to pass the course as a whole.
<b>Web</b>	<a href="http://www.cs.auckland.ac.nz/courses/compsci230s1c">www.cs.auckland.ac.nz/courses/compsci230s1c</a>

**COMPSCI 280**  
**Enterprise Software Development**

**S2 C**

Students will develop a distributed application using an Enterprise technology. The application will involve a database, and in developing the application, students will demonstrate skills in data modelling, manipulating and querying; and accessing a remote database server. Students will also learn how to model the system's requirements and design using established notations, to leverage a component-based Enterprise technology, and to use tools to support their activities. In addition, students will experience collaborative work through pair programming.

<b>Prerequisites</b>	COMPSCI 101 and 105
<b>Restriction</b>	INFOSYS 280
<b>Assessment</b>	20% assignments, 20% test, 60% exam
<b>Coordinator</b>	Angela Chang
<b>Important</b>	You must pass the practical and the theory sections separately to pass the course as a whole.
<b>Web</b>	<a href="http://www.cs.auckland.ac.nz/courses/compsci280s2c">www.cs.auckland.ac.nz/courses/compsci280s2c</a>

