

What you will learn

This is a course about linear algebra and calculus.

Roughly speaking, linear algebra is about matrices and vectors. It deals mainly with the algebraic problems associated with solving systems of linear equations. However, linear algebra also has a geometric side to it, and you will use it to solve problems about lines and planes (or even hyperplanes), and to calculate areas and volumes.

In calculus you will learn more about derivatives, integrals, differential equations and infinite series. You will also see how these ideas can be applied to problems in biology, economics, physics and engineering. Finally, you will see how derivatives can be adapted to functions of several variables.

You will also gain a basic knowledge of probability and its applications to calculus.

Some time is set aside for guest lectures. These are given by lecturers from various departments, visiting mathematicians and our graduate students.

Department of Mathematics & Statistics

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MATH 199(C): AIMS

*Advancing in Mathematical
Sciences (AIMS)*

*A 100-level Mathematics Course
for Secondary School Students*

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MATH 199(C): Advancing in Mathematical Sciences (AIMS)

- *Have you been involved in accelerated courses at school and/or passed Level 3 calculus credits in year 12?*
- *Is your ability in mathematics such that you would like an enrichment course while concurrently doing your year 13 work?*
- *Then our level 100 course for secondary school students is for you!*

It is designed particularly for students who may gain direct entry into level 200 university courses from school. It gives you the opportunity to study stimulating and interesting work while at school, and will prepare you well for second year mathematics.

This course will

START: Tuesday 16th February
(Term times coincide with those of the schools.)

ON: Tuesdays (lectures only)
Thursdays (a lecture and a tutorial)

FROM: 4.30pm – 6.30pm

AT: The University of Canterbury, Room 031 in
the basement of the Erskine Building

How to get into this course

Entry requirements

The course coordinator consults closely with schools about the suitability of students on an individual basis. Take as a (flexible) guideline, about 20 credits of mathematics with a good proportion of excellences at Level 2 or Level 3 NCEA, or the equivalent for students not doing a full NCEA programme or those doing alternative programmes such as Cambridge A levels.

Enrolment

Enrolment forms have been sent out to your school's Head of Mathematics. The Department of Mathematics and Statistics will confirm your acceptance when they receive the completed forms back from your school. Enrolments will be considered up to the second week in February (or later, in special circumstances).

Fees

The cost per student is \$815. If you attend a school which is eligible for STAR funding, then the cost to you may be a lot less. Schools are invoiced at the end of the first term, and you will not be charged fees if you withdraw before this time.

Credit

On successfully finishing this course, you are given a Certificate of Completion. You are graded on your year's work and this grade appears on your certificate. On enrolling at the **University of Canterbury** you are given 30 points credit towards a **Canterbury degree**, and may enrol in our level 200 mathematics courses and engineering mathematics courses.

You may also apply for an official University of Canterbury transcript that may be used for credit transfer and recognition.

Course details

Texts for recommended reading

Detailed handouts are given in most parts of the course, but you will need to do some background reading. The texts below (any edition will do) are used in our other level 100 courses, but there are many similar texts available.

Anton, "Calculus", Wiley.

Anton, "Elementary Linear Algebra", Wiley.

Assessment

Assessment consists of three projects, three tests and a final examination. You are also given credit for attending and preparing for tutorials.

The first test is held in week six of term one.

You should be scoring at least 60% in this test to be confident of coping with the demands of this course.

Tutorials

On Thursday afternoons, you are put into small groups of about 15 under the supervision of a tutor. Tutorials are an integral part of your course. In them you are given help with problem solving, an opportunity to discuss the lecture material and time to do some mathematics!

Projects

Projects give you a chance to explore and develop a topic in detail and to solve more realistic problems than can normally be set in tutorials and lectures. Project work involves using the computer packages MATLAB and Maple.