This is an important document. It contains all of the information you need about MATHS 108 in First Semester 2008. Please keep it and refer to it regularly.

Welcome

This course is designed as a general entry to university Mathematics, and covers topics in Calculus and Linear Algebra.

MATHS 108 is the main gateway to mathematics for students, including those taking this subject as part of other majors. It presents selected topics in algebra and calculus and their applications including: sets, real numbers, integers; linear algebra including matrices, linear functions, linear equations; functions, equations and inequalities; limits and continuity; differential calculus of one and two variables; integral calculus of one variable. These are studied in general settings using applications from science, commerce and information systems.

MATHS 108 (General Mathematics 1) is one of two courses designed for students continuing in Mathematics after Year 13 mathematics courses. It is for students who have achieved 12 credits in NCEA level 3 Mathematics with Calculus, or 18 credits in NCEA level 3 Mathematics with Statistics, or equivalent.

Where possible, students with 18 or more credits in NCEA level 3 Mathematics with Calculus (including some Merit credits) should instead enrol in MATHS 150 (Advancing Mathematics 1).

Lecturers

MATHS 108 will be taught by a team of lecturers this semester.
The course coordinator is Jamie Sneddon. The teaching team is:

Lecturer	Office	Ext	Email
Niels Bernhardt	303.112	88781	niels.bernhardt@math.auckland.ac.nz
Bruce Calvert	303.314	88790	calvert@math.auckland.ac.nz
Hugh Gribben	303.321	84747	h.gribben@math.auckland.ac.nz
Chris King	303.412	88818	king@math.auckland.ac.nz
Mike Meylan	303.407	85865	meylan@math.auckland.ac.nz
Peter Radonich	303.311	84931	p.radonich@math.auckland.ac.nz
Jamie Sneddon	303.305	82121	sneddon@math.auckland.ac.nz
Mike Thomas	303.327	88791	moj.thomas@auckland.ac.nz
Caroline Yoon	303.317	88740	caroline@math.auckland.ac.nz

Timetable — Lectures and Tutorials

Lectures are on Mondays, Wednesdays and Fridays. To avoid overcrowding, please attend the stream you enrolled for. The course is taught at 8am, 10am, 12noon and 5pm. The lecture rooms will be advised before lectures start through nDeva (`http://ndeva.auckland.ac.nz`).

Additionally, you will have chosen a tutorial time on nDeva; tutorials run throughout the week. You **must** attend the tutorial you chose in nDeva. The first tutorial is in week 2; between 10/3 and 14/3. If you have somehow NOT chosen a tutorial, please see Jamie Sneddon (in room 303.305) URGENTLY. If you do not attend tutorials, you will miss out on participation marks worth 5% of the course.

The following tables list all of the tutorials, times and room allocations. The 5-digit class number (between 56747 and 56780) of your tutorial will show with your enrolment on nDeva.

Tutorial Group	Day	Time	Class Number	Allocated Room
A	Monday	3pm	56747	303.114
B		4pm	56750	303.114
C	Tuesday	8am	56748	303.114
D		9am	56749	303.114
E1		11am	56751	303.114
E2			56752	303.B10
F1		12noon	56753	303.114
F2			56754	303.B10
G		1pm	56755	303.114
H		2pm	56756	303.114
I1		3pm	56757	303.114
I2			56758	303.B10
J1		4pm	56759	303.114
J2			56760	303.B10
K		5pm	56761	303.114

If two tutorials run at the same time (for example E1 and E2), be sure to attend the one you have enrolled for.
Check the class number of your tutorial on nDeva.
Both tutorials rooms are in building 303. Most tutorials are in 114 is on the first floor. When two tutorials run, the second in in the basement room B10.

Tutorial Group	Day	Time	Class Number	Allocated Room
L1	Wednesday	9am	56762	303.114
L2		9am	56763	303.B10
M		10am	56764	303.114
N1		11am	56765	303.114
N2			57666	303.B10
O		12noon	56767	303.114
P1		1pm	56768	303.114
P2			56769	303.B10
Q1		2pm	56770	303.114
Q2			56771	303.B10
R1		3pm	56772	303.114
R2			56773	303.B10
S1		4pm	56774	303.114
S2			56775	303.B10
T	Thursday	8am	56776	303.114
U		9am	56777	303.114
V		10am	56778	303.114
W		12noon	56779	303.114
X	Friday	9am	56780	303.114

Prerequisites & Restrictions

The expected background of a student enrolling in MATHS 108 is 12 credits in NCEA level 3 Mathematics with Calculus or 18 credits in NCEA level 3 Mathematics with Statistics, or equivalent background, **such as:** a pass in MATHS 102, a D or better in Cambridge A2 Mathematics, a C or better in AS Mathematics, or a pass in International Baccalaureate Mathematics.
Students who are not prepared for MATHS 108 are **strongly advised** to enrol in MATHS 102 instead. Past results indicate that students without the expected background are likely to fail.
MATHS 108 is restricted against MATHS 130, 150, 151 and 153, ENGSCI 111, and PHYSICS 111. You cannot take MATHS 108 after passing any of these courses, or take any of these courses after passing MATHS 108.
You may not take MATHS 101 or 102 in the same semester as or after taking MATHS 108; but you can take MATHS 108 after these courses.

Aims of MATHS 108

- To introduce students to learning mathematics at university level.
- To set a mathematical platform that can be relied upon in all undergraduate courses, including:
  - accepted conventions of mathematical notation and representation;
  - algebraic manipulative skills; and
  - understanding of basic mathematical ideas.
- To build understanding of calculus by:
  - developing an understanding of the derivative;
  - developing an understanding of the anti-derivative and integration;
  - consolidating differentiation techniques;
  - consolidating and filling gaps in integration techniques.
- To develop understanding of algebra and linear algebra in a first course which includes:
  - the overall idea of linear algebra as sets of equations;
  - basic skills in matrices;
  - conceptualisation of matrices including vectors.

Old and New

The syllabus of MATHS 108 changed in 2006. Before 2006, the many topics in this course were different, or covered in different ways. Some topics have been removed, and other topics have been added. There have also been some small changes more recently. When studying from past tests and exams, look first at the more recent available material. If you are unsure about whether a topic is examinable, look for it in the lecture notes or ask a lecturer.

The 2008 MATHS 108 course book is **substantially** different to previous editions.

Expectations & Workload

We expect students to spend 10 hours per week involved in each of their courses.

Expect this to involve 3 hours of lectures, a 1 hour tutorial, 3 hours of lecture preparation (reading the textbooks), and 3 hours of work on assignments and/or preparing for the test and exam.

Stay on top of the course material as it is covered. If you get behind it can difficult to catch up. Make use of the help available; ask for help as soon as you need it.

Text Books

We **strongly recommend** that you regularly use the following text books; suggested exercises from these text books are listed in the front of the course book. These books are sold packaged together at the University Book Shop (UBS), and are widely available second-hand.

[1] *Calculus: Early Transcendentals*, 8th Edition, by H. Anton, I. Bivens, S. Davis (Wiley).

[2] *Contemporary Linear Algebra*, H. Anton, R. Busby (Wiley).

Resources

All announcements made in class will also be made on Cecil (`www.cecil.auckland.ac.nz`). You can download the assignments and other resources from Cecil. Cecil is also used to generate the quizzes.

A course book containing the lecture slides for 2008 is available from UBS. The PDF files of this book are also available for download from Cecil.

Some lecturers will record lectures for you to access later. These will be accessible through Cecil. They should be used as an additional resource, **not** as a replacement for lectures. We cannot guarantee that all content will be recorded.

Matlab

The Department of Mathematics uses the software package Matlab for most undergraduate courses. Matlab knowledge is also useful for all subsequent mathematics courses. The basics of Matlab are easy to understand and a valuable skill to gain.

Matlab is an important part of this course; it is a component of most assessments, including the test and exam.

Matlab is available for use in the computer laboratories in building 303 and also in the Student Commons. Access Matlab via the Start Menu of the computer. The Mathematics and Statistics laboratories have tutors who are able to assist you.

Calculators

You are permitted to use a calculator in the MATHS 108 test and examination. Any standard scientific calculator (e.g. Casio FX82) is sufficient, but many students prefer a programmable (graphics) calculator. In tests and examinations you must be able to show that the memory of your programmable calculator has been cleared.

Assessment

There is **no plussage** in MATHS 108. This means that all components of the assessment count toward your final grade. Attempt all of the assessments, even if what you submit is incomplete.

3 Assignments	9%	(3% each)
10 Tutorials	5%	(0.5% each)
4 Quizzes	4%	(1% each)
2 Matlab Worksheets	2%	(1% each)
Test	20%	
Exam	60%	

Assignments will be due on the following Tuesdays. They will be posted on Cecil at least 8 days before they are due. Assignments will require the use of Matlab. All are due at **4pm**.

A1 1/4 A2 29/4 A3 20/5

Tutorials are weekly. You must attend the tutorial you signed up for on nDeva; only the tutor at **that tutorial** can record your tutorial mark on their class list.
Tutorial 2 runs for 2 weeks (around Easter) — from 17/3 to 28/3. You only need to attend one tutorial in this 2-week period, even if you tutorial group meet twice in that time.
Tutorial 5 is in the week of Anzac Day (25/4). Students enrolled in **Tutorial X** should attend ANY other tutorial between 17/4 and 24/4.

Quizzes are run online through Cecil. Each quiz will start on the Tuesday after the end of a topic (Topics 1 to 4) and run for at least one week, starting and ending at **2pm**. The quizzes will run as follows:

Q1 from 18/3 to 27/3 (Topic 1)	Q2 from 8/4 to 15/4 (Topic 2)	Q3 from 6/5 to 13/5 (Topic 3)	Q4 from 20/5 to 27/5 (Topic 4)

Matlab Worksheets are to be completed in the computer labs, at any time. The first is due near the start of the course, and is an introduction to Matlab. The second is due near the end of the course, and covers the Matlab related to Topics 1 to 4. Both are due at **4pm**.

M1 20/3 (Introduction to Matlab) M2 29/5 (Topics 1 to 4)

The **Test** will cover Topics 1, 2 and 3. It is from **6:15** to **7:50pm** on **May 8th**.
Allocated rooms will be announced after Easter.

The **Exam** is two hours. The exact date is not available until around the middle of semester.

Please note that Formulae Sheets are not provided in the test or exam. As noted previously, programmable calculators are permitted in the test and exam with their memory cleared.

Once more, please note that ALL components of the assessment will count toward your final grade. Attempt all of the assessments, even if what you submit is incomplete.

Getting Help

- Ask questions in class or in the tutorials.
- Get help and advice from the tutors in the Mathematics Assistance Room 303.B25, soon moving to 303.G16. Open from 10/3, daily 10am to 4pm.
- Join the Student Learning Centre, in the Kate Edger Commons; a mathematics tutor will be available. Workshops on each Topic may be run, according to demand.
- Visit your lecturers during office hours.

Collaborating & Cheating

You are encouraged to discuss problems with one another and to work together on assignments, but you must not copy another person's assignment. Assignment and quiz marks contribute to the final mark you receive in this course, and must reflect your own work, not the work of others. We view cheating on assignment and quiz work as seriously as cheating in an examination.

Acceptable forms of collaboration are:

- getting help in understanding from staff and tutors;
- discussing assignments and methods of solution with other students.

Unacceptable forms of collaboration ('cheating') are:

- copying all or part of another student's assignment, or allowing someone else to do all or part of your assignment for you;
- completing a quiz with, or for, another student;
- allowing another student to copy all or part of your assignment, or doing all or part of an assignment for somebody else.

If you are unsure about whether your collaboration is OK please discuss it with your lecturer. If you think that your collaboration will be viewed as cheating, you are probably correct.

Harassment & Complaints

Complaints about marking should be taken to your lecturers who are in a position to do something immediately. More general complaints can be taken up by your class representative. You may also approach the Head of Department or the Departmental Manager for Mathematics.

Harassment on any grounds, such as racial, sexual, religious and academic is totally unacceptable. Complaints about harassment are best taken to the University Mediator (extension 87478) or to any member of the Resolve Network whose names are displayed on posters around campus.

Lecture Timetable & Assessment Plan

Monday	Tuesday	Wednesday	Thursday	Friday	Tutorial
3/3 Lec 1	4/3	**5/3** Lec 2	6/3	**7/3** Lec 3	
10/3 Lec 4	11/3	**12/3** Lec 5	13/3	**14/3** Lec 6	T1
17/3 Lec 7	18/3 start Q1	**19/3** Lec 8	20/3 M1	21/3 *Good Friday*	T2*
24/3 *Easter Monday*	25/3 *Easter Tuesday*	**26/3** Lec 9	27/3 end Q1	**28/3** Lec 10	T2 *
31/3 Lec 11	1/4 A1	**2/4** Lec 12	3/4	**4/4** Lec 13	T3
7/4 Lec 14	8/4 start Q2	**9/4** Lec 15	10/4	**11/4** Lec 16	T4
14/4	15/4 end Q2	16/4	17/4	18/4	
21/4 Lec 17	22/4	**23/4** Lec 18	24/4	25/4 *Anzac Day*	T5 X
28/4 Lec 19	29/4 A2	**30/4** Lec 20	1/5	**2/5** Lec 21	T6
5/5 Test Revision	6/5 start Q3	**7/5** Lec 22	8/5 TEST	**9/5** Lec 23	T7
12/5 Lec 24	13/5 end Q3	**14/5** Lec 25	15/5	**16/5** Lec 26	T8
19/5 Lec 27	20/5 start Q4 A3	**21/5** Lec 28	22/5	**23/5** Lec 29	T9
26/5 Lec 30	27/5 end Q4	**28/5** Lec 31	29/5 M2	**30/5** Lec 32	T10
2/6 *Queen's Birthday*	3/6	**4/6** Lec 33	5/6	**6/6** Exam Revision	

Lecturers

	3/3 to 26/3	28/3 to 23/4	28/4 to 16/5	19/5 to 6/6
Stream	Lec 1 to 9	Lec 10 to 18	Lec 19 to 26	Lec 27 to 33
8 am	Niels Bernhardt		Peter Radonich	
10 am	Bruce Calvert		Mike Meylan	
12 noon	Hugh Gribben	Mike Thomas	Jamie Sneddon	
5 pm	Caroline Yoon		Chris King	

Lecture Topics

Topic 1 — Functions and Limits
Lec 1: Introduction and Motivations
Lec 2: Relations and Functions
Lec 3: Using Functions
Lec 4: Trigonometric Functions
Lec 5: Limits Intuitively
Lec 6: Computing Limits
Lec 7: Continuity

Topic 2 — Vectors, Lines and Planes
Lec 8: Scalars and Vectors
Lec 9: Vector Arithmetic
Lec 10: Dot Product
Lec 11: Lines
Lec 12: Planes
Lec 13: Intersections

Topic 3 — Linear Systems and Matrices
Lec 14: Systems of Linear Equations
Lec 15: Reduced Row Echelon Form
Lec 16: Types of Solutions
Lec 17: Matrix Arithmetic
Lec 18: Matrix Inverses
Lec 19: Solving Systems with Matrices
Lec 20: Determinants
Lec 21: Cross Product

Topic 4 — Differentiation
Lec 22: Differentiation as a Limit
Lec 23: Differentiation Rules
Lec 24: Implicit Differentiation
Lec 25: Curve Sketching
Lec 26: First Derivative Test
Lec 27: Second Derivative Test

Topic 5 — Integration and Functions of 2 Variables
Lec 28: Indefinite Integrals
Lec 29: Integration by Substitution
Lec 30: Integration by Parts
Lec 31: Definite Integrals
Lec 32: Functions of 2 Variables
Lec 33: Tangent Planes

Changes have been made to the lectures for 2008; do not use the 2007 course book.

Format of Major Assessments

The test and exam each consist of several blocks of questions, with four multi-choice and one short answer question in each block. Look at the 2007 second semester and 2008 summer school tests and exams to see how the block format works; the test and exam from 2007 second semester, with answers, are included in the back of the 2008 course book.

Test Content
Topic 1: 2 blocks
Topic 2: 2 blocks
Topic 3: 2 blocks
6 blocks in 90 minutes

(15 minutes per block)

Exam Content
Topic 1: 1 block
Topic 2: 1 block
Topic 3: 2 blocks
Topic 4: 2 blocks
Topic 5: 2 blocks
8 blocks in 120 minutes

The test and exam will both contain one block of questions (worth 15 marks) about an attachment of Matlab commands and output. The block the attachment relates to will be chosen at random by the examiners — you will not be told which block it is.