



UNSW
SYDNEY

Course Outline

MATH1031

Mathematics for Life Sciences

School of Mathematics and Statistics

Faculty of Science

Term 3, 2021

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1. Staff

Position	Name	Email	Room*
Directory of First Year	Assoc Prof Jonathan Kress	j.kress@unsw.edu.au	RC-3073
Course Convenor	Dr Joshua Capel	j.capel@unsw.edu.au	RC-5107
Lecturer-in-charge of Mobius	Dr Joshua Capel	j.capel@unsw.edu.au	RC-5107
Lecturers	Mr Ian Whiteway Dr Joshua Capel	i.whiteway@unsw.edu.au j.capel@unsw.edu.au	

*Note that the Red-Centre is closed at the time of production of this course outline and might remain closed throughout the term. Staff consultation will take place online and begin in Week 2. For details see Moodle.

2. Administrative matters

Contacting the Student Services Office

Please visit the School of Mathematics and Statistics web-site for a wide range of information on School Policies, Forms and Help for Students by visiting the “**Student Services**” page.

For information on Courses, please go to “Current Student”, “Undergraduate and/or Postgraduate”, “**Courses Homepage**” for information on all **course offerings**.

The “Student Notice Board” can be located by going to the “Current Students” page. Notices are posted regularly for your information here. Please familiarise yourself with the information found in these locations. The School web page is found: <https://www.maths.unsw.edu.au>

If you cannot find the answer to your queries on the web pages you are welcome to contact the Student Services Office directly. The First Year Advisor in the Student Services Office is Ms Hilda Cahya. All administrative enquiries concerning first year Mathematics courses should be sent to H Cahya, either:

- By email to ug.MathsStats@unsw.edu.au
- By phone: 9385 7011 (leave a message with contact phone number to have call returned).
- Or in person to the Red Centre building, level 3, room 3072. NB: There is no contact at this office without prior appointment, please email while working remotely.

Change of tutorials, due to timetable clashes or work commitments, permission to take class tests outside your scheduled tutorial, advice on course selection and other administrative matters are handled in the Student Services Office, please email ug.MathsStats@unsw.edu.au

Constructive comments on course improvement may also be emailed to the Director of First Year Mathematics, A/Prof Jonathan Kress. Should we need to contact you, we will use your official UNSW email address of zstudentno@unsw.edu.au in the first instance. **It is your responsibility to regularly**

check your university email account. Please use your UNSW student email and state your student number in all emails to the Student Services Office.

3. Course information

Units of credit: 6

Assumed knowledge: a level of knowledge equivalent to achieving a band 4 HSC Mathematics Advanced. Students who have taken Mathematics Standard will not have achieved the level of knowledge which is assumed in this course.

Note: This course is not intended for students who propose to study a substantial amount of Mathematics beyond first year level. Many later year courses in Mathematics have completion of MATH1231, MATH1241 or MATH1251 as a prerequisite. This course can be taken as a preparatory course by students who need to take MATH1131 but do not meet the assumed knowledge requirement.

Teaching times and locations: see the link on the Handbook web pages:

<http://timetable.unsw.edu.au/2021/MATH1031.html#S3S>

Course summary

MATH1031 will provide you with a good knowledge of topics in Calculus and Linear Algebra and show applications in interdisciplinary contexts through lectures, videos and exercises. It will enhance your skills in analytical thinking and problem solving through illustrative examples in lectures, problem-based tutorials and an assignment. The course will also engage you in independent and reflective learning through your independent mastery of tutorial problems and Maple. The mathematical skills that you will develop are generic problem-solving skills, based on logical arguments that can be applied in multidisciplinary work. You will be encouraged to develop your communication skills through active participation in tutorials, and by writing clear and logical arguments in the assignment and when solving tutorial problems.

For the course syllabus, see the syllabus and lecture schedule at the end of this document.

Course aims

The aim of MATH1031 is that by the completion of the course you understand the concepts and techniques involved in the topics listed in the syllabus, and have developed skills in applying these concepts and techniques to the solution of the actual problems within your discipline areas.

New ideas and skills are introduced in lectures with an emphasis on the use of examples taken from the biological sciences. You will then develop these skills by applying them in tutorials and to the assignment and computing problems. The use of Maple in MATH1031 provides an opportunity to see how computers can be used in a wide variety of mathematical problem solving.

Students often have great difficulty translating between a real-world problem and its mathematical representation and so practising this skill is an important part of MATH1031. The ability to communicate effectively using mathematical language and to think analytically are important learning outcomes for this course.

Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Apply techniques and concepts from the syllabus to solve mathematical problems,
2. Formulate mathematical models from real world scenarios using techniques from the syllabus,
3. Recognise how mathematics is used to solve problems in other disciplines.
4. Use computer algebra as an aid to solving appropriate problems,
5. Communicate mathematical ideas, techniques and results effectively, using appropriate mathematical terminology.

4. Learning and teaching activities

Lectures

Lectures run in weeks 1 to 10 except for week 6 which will have no classes. You can find the lecture times on your myUNSW timetable. In Term 3 2021 live lectures will be streamed online via Blackboard Collaborate. A link will be provided on Moodle. These lectures will also be recorded and available to watch at a later time, however, it is recommended that students attend the lectures live online.

Note: The lecture on Monday 4th October (Week 4) will be cancelled due to a public holiday. A pre-recorded lecture may be provided as a replacement. Details will be announced closer to the time.

Tutorials

There are two tutorials per week in MATH1031 and these run in weeks 1 to 10 with the exception of week 6. You can enrol in either a face-to-face tutorial, or an online tutorial. The face-to-face tutorials are subject to availability and may closed if circumstances change.

In Term 3 2021 the online classroom tutorials will be organised using Blackboard Collaborate, a virtual classroom system. A link to the virtual classroom where you will attend your tutorial will be provided on Moodle. During these tutorials you will participate in breakout rooms, your camera and your audio must be on in these breakout rooms unless you have prior permission from the course convenor.

For both types of tutorials, a laptop with internet access is recommended.

Students can change their tutorials via myUNSW until the end of week 1. After that time, they can only change tutorials by requesting this through the ug.MathsStats@unsw.edu.au website, providing your student ID number and advice about a timetable clash or work commitments.

The end of the document has a lecture and tutorial schedule.

UNSW Moodle

The School of Mathematics and Statistics uses the Learning Management System called Moodle. To log into Moodle, use your zID and zPass at the following URL:

<https://moodle.telt.unsw.edu.au>

Once logged in you should see a link to MATH1031 that will take you to the homepage in Moodle. Here you will find announcements, general information, notes, lecture slides, classroom tutorial and homework problems and links to online tutorial and assessments.

5. Assessments

Overview

Your final raw mark will be made up as follows:

Assessment task	Weight	Course Learning Outcomes
Online tests	10%	1 and 4
Mastery tests	45%	1
Assignment	10%	1, 2, 3 and 5
End of term exam	35%	1, 2, 4 and 5

Note:

- Students who complete the Online tests, Mastery tests, and Assignment to a satisfactory level will pass the course without the need to sit the end of term exam. A detailed explanation of the assessment structure is below.
- The end of term exam is aimed at students who are seeking a credit or above. The final exam will not contain any routine questions, it will contain substantial questions requiring a good understanding of the material presented in the course and thorough and clear explanation. The final exam mark will be moderated. See later section on the final exam for more details.
- Only students who have obtained 50 of the available 65 pre-exam marks will be permitted to sit the paper final exam. Students with less than 50 will sit further basic skills tests in order to pass with a final mark capped at 50.
- You will be able to view your final exam timetable once Exams Central has finalised the timetable. Please visit: <https://student.unsw.edu.au/exam-timetable> for details.
- It is very important that you understand the University's rules for the conduct of Examinations and the penalties for **Academic Misconduct Guide**. This information can be accessed through myUNSW at: <https://student.unsw.edu.au/exams> NB: In recent years there have been cases where severe penalties have been imposed for misconduct in relation to tests and exams in Maths courses.
- Assessment criteria: UNSW assesses students under a standards based assessment policy. For how this policy is applied within the School of Mathematics and Statistics, please visit the web site: <http://www.maths.unsw.edu.au/currentstudents/assessment-policies>
- If you are unwell / miss your **final examination**, please refer to the Special Consideration Policy by visiting the website: <https://student.unsw.edu.au/special-consideration>

Online Tests

There will be a sequence of eight online tests conducted using Möbius and may be attempted anywhere with internet access and a suitable web browser. Instructions for using Möbius will be provided on Moodle.

- Check the availability of the online tests on the Möbius class for this course. There is no time limit on each test and there are an unlimited number of attempts in each test. You are strongly

advised to complete the online tests as recommended in the Schedule of pre-exam assessments.

- All online tests will be closed by Friday Week 10. Although students can attempt any of the available online tests until they are closed, students are expected to take these tests in their designated weeks and failure to do so may result in rejection of applications for special consideration.
- Each online test contains a Mastery test component and a computing component. There will be six questions in the Mastery test component and two questions in the computing component.
- Questions in the Mastery test component cover the materials from lectures.
- In MATH1031 you will learn how to use the computer algebra software called Maple. During on-campus teaching this software is access on the computer Red-Centre labs, but at all other times you can Maple on your own computer via the myAccess service:

<https://www.myaccess.unsw.edu.au/>

Worksheets and notes are provided for this on Moodle. The questions in the computing component test your understanding of the worksheets and notes and the use of Maple. More details of the Computing Component of this course are provided later in this course outline.

- A passing student would be expected to score at least 80% in these tests. The best 6 of these 8 tests will count 10% towards your final grade.
- The Online Tests are available for an extended period so no medical certificates or other reasons will be accepted for missing these tests.

Mastery Tests

The largest component of the assessment in MATH1031 is the Mastery Tests (15% each). The Mastery Tests will be online and taken place in weeks 4, 7 and 10. You are required to book a time for each Mastery test. Information for booking and taking the test will be on Moodle.

- The three Mastery Test 1, 2, 3 will contain a selection of questions from the Mastery Test components in OT1 to OT3, OT4 to OT5, OT6 to OT8, respectively.
- A mark of 80% in each of the Mastery Tests is considered to be a passing level.
- If you miss a Mastery Test due to illness or other misadventure, you must obtain a medical certificate, or other suitable documentation, for the day of your test, and apply for special consideration online through myUNSW. Please refer to the information on Special Consideration and the fit-to-sit rule for details.
- If your pre-exam mark (composed of marks from the online tests, the assignment and the Mastery tests) is less than 50, there will be an opportunity to resit each of the Mastery Tests on a day in the study period at the end of the term chosen by the director of the first year. A student may retake any or all of the Mastery Tests to increase their pre-exam mark but the new pre-exam mark will be capped at 50 out of 65.
- After the resit opportunity, eligibility to sit the final exam will be determined. Students who at this time have not achieved 50 of the 65 pre-exam marks will not be able to take the final exam but will be permitted to retake any of the Mastery Tests at the same time as the scheduled final exam. In that case the student's final mark will be capped at 50.

For example, a student gets 6 out of 10 for the assignment, 8 out of 10 from the online tests, 13, 10, 8 in the Mastery Tests at the closing date of the online tests. The pre-exam mark will be 45. They will be allowed to resit the Mastery tests in the study period. If they improve the marks of the three MTs to 15, 12 and 11, the total raw marks for the pre-exam components will be 53. Since, in this case, the pre-exam mark is capped at 50, the student will only get 50 for the pre-exam mark.

Written Assignment

The purpose of the assignment is to improve your mathematical writing by providing feedback on your writing and helping you to recognise good mathematical writing. The assignment will be in two parts.

In part A, several short videos on how the mathematics you are studying in MATH1031 is being used by someone working in a non-mathematical field will be provided. You will choose one of these and write a few paragraphs about the video.

In part B, exam style questions will be presented to you on Maple TA and your job will be to write solutions to these questions. You will be able to check the correctness some parts of your answer using Maple TA so your main task will be to present your answers well with good explanations of your working.

Your work will need to be typed (not handwritten and scanned) and you will submit your work online through links on Moodle. After submission you will need to assess your own work and the work of 4 other students. Tutors will also grade parts of your submission and provide feedback on your writing.

Complete details of the process for this will be provided when the assignment is released.

Note that you must submit your work in two places – there are separate submission processes for the tutor to mark and for the peer review.

The assignment will be marked out of 10. A penalty of 0.5 mark per day late will be applied to late submissions up to a maximum of 5 days late. Work submitted later than 5 days will be marked, and feedback given, but a zero will be recorded.

A 4pm deadline means you must submit before 4pm. A submission at 4pm is late. If you submit late to the peer review then you will need to wait an extra week before you complete your peer review.

Timeline

Week 6 Monday 9am (or earlier)	Assignment opens and details released
Week 8 Friday 4pm	Submission deadline
Week 8 Friday 5pm	Peer assessment opens
Week 9 Friday 4pm	Peer assessment deadline
Week 10 Friday 4pm	Feedback released

Grade

The mark for your assignment will be divided between the tasks as shown below.

Part B mark from tutor	4 marks
Correct answers on Möbius	2 marks
Mark from peers	2 marks
Peer assessment quality mark from Moodle	2 marks

Schedule of pre-exam assessments

Week	Online Tests	Mastery Tests	Assignment
Week 1			
Week 2	OT1		
Week 3	OT2		
Week 4	OT3	Based on Mastery test component of OT1 to OT3	
Week 5	OT4		
Week 6			Assignment released
Week 7	OT5	Based on Mastery test component of OT4 to OT5	
Week 8	OT6		Submission deadline
Week 9	OT7		Peer assessment deadline
Week 10	OT8	Based on Mastery test component of OT6 to OT8	

Final exam

The final exam is designed for students seeking a credit or above. To be allowed to attend the final exam, a student must have scored at least 50/65 in the pre-exam assessment after the study period Mastery Test resit.

The exam contains only harder problems that require the use of techniques from the course applied in new unseen situations. There are no pass level questions in the exam and so a mark of zero in the exam is consistent with obtaining a pass since a pass must be obtained before the final exam.

The exam will be marked out of 40 with up to 10 marks allocated to the correctness of mathematical notation, clarity of explanation, including well written conclusions for each question. The mark for the exam will be moderated so that a student obtaining a close to full marks in the pre-exam assessment and about half of the marks in the exam will receive a distinction. This means that 20/40 in the exam will be moderated to approximately 10/35. See the next section for more details of this moderation.

Explanation of grade standards in MATH1031

The assessment structure in MATH1031 is designed so that a pass level is demonstrated in the pre-exam assessment which consists of the Online Tests, the Mastery Tests and the Assignment. The Online Test assesses basic skills and ability to use mathematical software. The Mastery Tests assess basic skills and the assignment assesses critical thinking, mathematical writing and applications of the basic skills to extended problems

To pass, a student must score 50/65 in the pre-exam assessment. There is no requirement to attend the final exam to pass the course.

To obtain a credit, a student is expected to easily meet the pass level and do well, but not perfectly, in about one third of the exam. For example, a raw exam mark of 10/40 would be moderated to 5/35 and combine with a pre-exam mark of 60/65 to give a final mark of 65.

To obtain a distinction, a student is expected to have a near perfect score in the pre-exam assessment and obtain about half of the exam marks. For example, a raw exam mark of 20/40 would be moderated to 10/35 and combine with 65/65 to give 75.

To obtain a high distinction, a student is expected to have a near perfect score in the pre-exam assessment and obtain about 3 quarters of the exam marks. For example, a raw exam mark of 30/40 would be moderated 20/35 and combine with 65/65 to give 85.

6. Computing in MATH1031

Why computing?

MATH1031 covers many mathematical techniques that are useful in understanding and predicting the behaviour of biological systems. In order for you to become comfortable with these techniques, the problems presented in lectures and tutorials often involve only small data sets, few variables or simple functions.

The aim of the computing component of this course is to show you how you can use **computer algebra software** to apply the mathematics you have learnt to solve problems that would be very cumbersome to tackle by hand. In MATH1031, the software we will be using is called Maple. Even for relatively simple problems Maple can be useful as it does not make simple arithmetic errors!

Whether you continue with mathematics after first year or not, the computing skills you learn with us should still be useful in your university studies and beyond because:

- Your experience with Maple will make it easier to learn other software packages.
- Many other disciplines use packages like Maple.
- Symbolic computing techniques will be useful when you use mathematics in your future career.

UNSW has a policy that all students (no matter what program they are in) should be introduced to the basic techniques of computer use. For students in science and engineering programs, part of this requirement is met by the computing included in first year mathematics.

What sort of computer or applications do I need?

The School of Mathematics and Statistics provides computing labs in Red Centre with everything you will need for computing in MATH1031. This term, the Labs are closed but you can use Maple on your own computer via the myAccess web service.

<https://www.myaccess.unsw.edu.au/>

What will I have to do and when?

You will learn how to use the application Maple via working through a set of Maple worksheets. There will be questions that require the use of Maple in the Weekly Online Tutorials.

You use Maple via myAccess, you should follow the instruction on the myAccess web page to install Citrix Receiver and access your applications. You then should watch the introductory videos for Maple provided on Moodle.

You can continue to work through the Maple worksheets and notes. Information about which worksheet is relevant to which online test will be provided on Moodle.

Getting help

There is a wide range of self-help material in the computing pages of our School web site and in MATH1031 module on UNSW Moodle. These should be the places you check in the first instance.

The Maths Drop-in Centre incorporates Lab Consultations who can help with Maple if you need help using this software.

For all Maple problems (but not equipment faults, login problems and password problems) you should use the online Drop-in-Centre service

<https://www.maths.unsw.edu.au/currentstudents/Mathematics-Drop-in-Centre>

or contact your tutor if it is a problem with the mathematics involved.

For problems in installation of Citrix Receiver, myAccess, connection problems of Maple TA, you should contact UNSW IT Service Centre. Phone number and email address of the IT Service Centre can be found on myAccess web page.

If all else fails, contact or send an email to the Course Convenor, Dr. Joshua Capel (Red Centre Room 5107), email j.capel@unsw.edu.au.

Information about School computing facilities can be found in

<https://www.maths.unsw.edu.au/currentstudents/computing-information>

Code of Conduct

All students are assumed to be aware of the *Acceptable Use of UNSW ICT Resources* policy, a copy of which is at

<https://my.unsw.edu.au/student/resources/ComputingCommunicationRule.html>

In addition, the School of Mathematics and Statistics reserves the right to monitor all use of its computer systems, and to share the monitoring results with the relevant law enforcement authorities. The computing facilities provided by the School of Mathematics and Statistics must be used only for tasks related to the mathematics course(s) for which your computing account has been created. Misuse of computers is a serious offence and will be treated as a case of academic misconduct. This includes damage to or theft of any part of the equipment. A breach of security will be treated as a case of serious academic misconduct.

Breach of security includes but is not limited to

- deliberately providing a password to another person (student or otherwise);
- attempting to gain unauthorised access to files within the system (“hacking”);
- deliberately introducing computer viruses;
- copying of assignments (by email or any other means).

Electronic mail (email) facilities are provided by the University so that you can communicate with lecturers and tutors. All use of email is monitored, and action will be taken against anyone who makes excessive use of email or uses it to send annoying, obscene, sexist or racist messages to other users or to engage in academic misconduct. Internet and other electronic communication services are provided to allow you to access our computers from other parts of the campus and from home and to

transfer assignments which have been completed on other computers. These services are NOT provided so that you can play games, watch videos, or indulge in other activities not related to university studies. All electronic communications using the School's facilities are monitored to ensure that these facilities are being used in a responsible manner. Likewise, the disk space allocated to your account should be used only for keeping files related to your course, and the system administrator may remove any files which are not associated with University work.

These restrictions are imposed because computing resources are limited and there are thousands of other users of the system (over 4000 students with logins for the Red Centre labs). We all have to live and work together and you are expected to be considerate to other users. This is the bottom line when it comes to acceptable behaviour. If you have any doubts about whether an action is acceptable, don't do it.

Health and Safety Issues

Students should be aware that using a keyboard or performing any repetitive task for a long uninterrupted period may be associated with physical discomfort and/or muscular or other injury. To lessen the risk of such problems, a break from typing should be taken at regular intervals, a good body position adopted, wrists should be kept straight as much as possible and not rested on a sharp edge.

If you feel pain, numbness, tingling, weakness, cramping, or stiffness in your hands, wrists, arms, shoulder, neck, or back, see a qualified health professional. For further information contact the School of Mathematics and Statistics General Office.

7. Expectations of students

School Policies

The School of Mathematics and Statistics has adopted a number of policies relating to enrolment, attendance, assessment, plagiarism, cheating, special consideration etc. These are in addition to the Policies of The University of New South Wales. Individual courses may also adopt other policies in addition to or replacing some of the School ones. These will be clearly notified in the Course Initial Handout and on the Course Home Pages on the Maths Stats web site.

Students in courses run by the School of Mathematics and Statistics should be aware of the School and Course policies by reading the appropriate pages on the Maths Stats web site starting at:

<http://www.maths.unsw.edu.au/currentstudents/assessment-policies>

The School of Mathematics and Statistics will assume that all its students have read and understood the School policies on the above pages and any individual course policies on the Course Initial Handout and Course Home Page. Lack of knowledge about a policy will not be an excuse for failing to follow the procedure in it.

Academic integrity, referencing and plagiarism

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect,

responsibility and courage.¹ At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site <https://student.unsw.edu.au/plagiarism>, and
- The *ELISE* training site <http://subjectguides.library.unsw.edu.au/elise>

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>.

8. Readings and resources

Text Book

There is no set textbook for MATH1031. All topics listed in the syllabus will be comprehensively covered by the lecturers at the appropriate times. The syllabus and lecture schedule at the end of this document contains references for each topic.

9. Getting help outside tutorials

Staff Consultations

From week 3 there will be a roster which shows for each hour of the week a list of names of members of staff who are available to help students in the first year mathematics courses, no appointment is necessary. This roster will be announced in the Moodle course page at the end of week 2 and can be located by visiting web page:

<http://www.maths.unsw.edu.au/currentstudents/consultation-mathematics-staff>

Mathematics Drop-in Centre

The Maths drop-in centre provides free help to students with certain first and second year mathematics courses. All first year MATH courses are supported. The Maths drop-in centre operates online via Moodle, opening times are from 10am to 3pm from Mondays to Thursday, 10am to 1pm on Fridays.

The Maths drop-in centre schedule will be available on the Schools website and Moodle page below by the end of week 1. Please note that no appointment is necessary, this is a drop-in arrangement to obtain one-on-one help from tutors

<https://www.maths.unsw.edu.au/currentstudents/Mathematics-Drop-in-Centre>

¹ International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

Lab Consultants

For online help with the Maple computing component of the first year courses, consultants will be available through Drop-in Centre.

Additional support for students

- The Current Students Gateway: <https://student.unsw.edu.au/>
- Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>
- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>
- Equitable Learning Services: <https://student.unsw.edu.au/els> (formerly Disability Services Unit)
- UNSW IT Service Centre: <https://www.it.unsw.edu.au/students/index.html>

10. Special Consideration

Please adhere to the Special Consideration Policy and Procedures provided on the web page below when applying for special consideration.

<https://student.unsw.edu.au/special-consideration>

Please note that the application is not considered by the Course Convenor, it is considered by a centralised team of staff at the Nucleus Student Hub.

The School will contact you (via student email account) after special consideration has been granted to reschedule your missed assessment.

For applications for special consideration for *assignment extensions*, please note that the new submission date and/or outcome will be communicated through the special consideration web site only, no communication will be received from the School.

For *final exams* with special consideration granted, the Exams Unit will email the rescheduled “supplementary exam” date, time and location to your student zID email account directly. Please ensure you regularly check your student email account (zID account) for this information.

The supplementary exam period/dates can be found at this web site:

<https://student.unsw.edu.au/exam-dates>

Please ensure you are aware of these dates and that you are available during this time.

Important Notes

- If you believe your application for Special Consideration has not been processed, you should email specialconsideration@unsw.edu.au immediately for advice.

- If you suffer from a chronic or ongoing illness that has, or is likely to, put you at a serious disadvantage, then you should contact the Equitable Learning Services (formerly known as the Disability Support Services) who provide confidential support and advice. Their web site is: <https://student.unsw.edu.au/els>
- Equitable Learning Services (ELS) may determine that your condition requires special arrangements for assessment tasks. Once the School has been notified of these, we will make every effort to meet the arrangements specified by ELS.
- Additionally, if you have suffered significant misadventure that affects your ability to complete the course, please contact the Director of First Year, Associate Professor Jonathan Kress by email. The contact details are to j.kress@unsw.edu.au.

Professor Adelle Coster

Head, School of Mathematics and Statistics

University Statement on Plagiarism

This statement has been adapted from statements by the St James Ethics Centre, the University of Newcastle, and the University of Melbourne.

Plagiarism is the presentation of the thoughts or work of another as one's own.² Examples include:

- Direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement
- Paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- Piecing together sections of the work of others into a new whole;
- Presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,
- Claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.³
- Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism.
- The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.

The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. It can be located at: <http://www.lc.unsw.edu.au/academic-integrity-plagiarism>

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- Correct referencing practices;
- Paraphrasing, summarising, essay writing, and time management;
- Appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

² Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle.

³ Adapted with kind permission from the University of Melbourne.

11. Syllabus, Lecture Schedule and References

Week	Topics To Be Covered	References
1	Introduction	
	Matrix algebra	(4): 2.1
	Matrix applications	(4): 2.1
	Inverse, identity and zero matrices	(4): 2.2, 2.3
	Matrix equations	(4): 2.3
2	Functions	(1): 1.4
	Further trigonometry	(1): 8.1, 8.2
	Special functions	(1): 4.1, 4.3, 8.3
	Limits and continuity	(1): 1.5, 1.6
	Differentiation	(1): 2.1, 2.2, 2.4, 2.5, 3.1
3	Calculus of the special functions	(1): 4.2, 4.4, 6.4
	Curve sketching	(1): 3.7
	Maxima and minima	(1): 3.3, 3.4
	Modelling with the exponential function	(1): 4.5
	Revision	
4	Modelling with the trigonometric functions	(1): 8.4
	Least squares line of best fit	(4): 2.5
	Semi-log plots	(2): 3.3
	Log-log plots	(2): 3.3
	Points, lines and planes in space	(1): 7.1, 7.2
5	Echelon form and row operations	(4): 1.1,
	Systems of linear equations with unique solutions	(4): 1.1, 1.2
	Applications of systems with unique solutions	(4): 1.3
	Systems of linear equations with non-unique solutions	(4): 1.2
	Applications of systems with non-unique solutions	(4): 1.3
7	Matrix transformations	(4): 2.5
	Markov processes	(4): 2.5
	Long term and steady state solutions	(4): 2.5
	First and second order difference equations	(2): 11.3, 11.4
	Implicit and parametric differentiation	(1): 2.7, (2): 4.7
8	Related rates	(1): 2.8
	Applications of the integral	(1): 5.1 - 5.4
	Integration by substitution	(1): 6.1
	Integration by parts	(1): 6.2
	Separable differential equations	(1): App D1, D2

1. Calculus an Applied Approach by Larson and Edwards
2. Mathematics for the Biological Sciences by Arya and Lardner
3. Advanced Engineering Mathematics by Erwin Kreyszig, 7th edition.
4. Elementary Linear Algebra by Larson and Edwards, 4th edition

Copies of the above four books can be found in the LIBRARY

Week	Topics To Be Covered	References
9	Linear first order differential equations	(1): App D3
	Modelling with first order differential equations	(1): App D3
	Homogeneous second order differential equations	(3): 2.2, 2.3
	Non-homogeneous second order differential equations	(2): 10.7
	Systems of differential equations - competing species	(3): 2.2, 2.3
10	Newton's method - bisection of the interval	(1): 10.6
	Maclaurin series	(1): 10.5
	Partial differentiation	(1): 7.3, 7.4
	Local maxima and minima in space	(1): 7.5
	Revision	

1. Calculus an Applied Approach by Larson and Edwards
 2. Mathematics for the Biological Sciences by Arya and Lardner
 3. Advanced Engineering Mathematics by Erwin Kreyszig, 7th edition.
 4. Elementary Linear Algebra by Larson and Edwards, 4th edition
- Copies of the above four books can be found in the LIBRARY**

12. Tutorial Schedule

Week	Topics To Be Covered
1	Revision on basic algebra and trigonometry
	About online tests Matrix algebra
2	Matrix applications Inverse, identity and zero matrices
	Matrix equations Functions/further trigonometry
3	Special functions Limits and continuity
	Differentiation Calculus of the special functions
4	Curve sketching Maxima and minima
	Modelling with the exponential function Modelling with the trigonometric functions
5	Least squares line of best fit Semi-log plots/log-log plots
	Points lines and planes in space Echelon form and row operations
7	Systems of linear equations with unique solutions Applications of systems with unique solutions
	Systems of linear equations with non-unique solutions Applications of systems with non-unique solutions
8	Matrix transformations Markov processes/long term and steady state solutions
	First and second order difference equations Implicit and parametric differentiation/related rates
9	Applications of integration Integration by substitution/integration by parts
	Separable/first order differential equations Modelling with first order differential equations
10	Homogeneous and non-homogeneous second order differential equations/systems of differential equations
	Newton's method - bisection of the interval Maclaurin series