Contents

lectures live online.

An alternative pre-recorded lecture option will also be available to all students. This is the primary set of lectures for students in the WEB stream, however, students in the WEB stream can also attend the live lectures or watch the live lecture recordings if they wish.

MATH1131 Mathematics 1A

	Monday	Tuesday	Wednesday	Thursday	Friday
Lecture (A)	12 – 2pm (w1-5, 7-9)		10am – 12pm (w1-5, 7-10)		1 – 2pm (w1-5, 7-8, 10)
Lecture (B)	9 – 11am (w1-5, 7-9)			10 – 12pm (w1-5, 7-10)	11am – 12pm (w1-5, 7-8, 10)

Tutorials and EXM: Refer to your online timetable for day and time details.
MATH1131:

time via myUNSW until the end of week 1. After that, they can only change tutorials by contacting the Mathematics and Statistics student services (see page 4) with evidence of a timetable clash or work commitments.

The main reason for having Classroom Tutorials is to give you a chance to tackle and discuss problems which you find difficult or do not fully understand, so it is important to try at least a selection of tutorial problems before attending your class so that you know the questions you would like to ask of your tutor. A schedule of suggested homework problems, to be attempted before your classroom tutorial, will be posted on Moodle. The Week 1 Classroom Tutorial will be an introductory tutorial.

If your tutorial falls on a public holiday, it will be cancelled for that week. You can optionally attend another tutorial class from the online options for that week only. You can find the times of tutorials on the central timetable, *links above in the Lecture & Tutorial Structure table*, or in the Blackboard Collaborate session list.

Weekly Möbius Lesson

There is a weekly Möbius lesson due on Tuesday of the following week at 11am for MATH1141 and 1pm for MATH1131. The first deadline would usually be on Tuesday of week 2. Note this deadline will remain the same even when it falls on a public holiday. Each Möbius lesson will consist of 6 topics. Each topic will consist of a short video or self-paced lesson and some corresponding exercises on Möbius. These will be mostly algebra and calculus topics but most weeks will also have a Maple topic and there may be other topics.

The weekly Möbius lessons are an integral part of this course. They will help you stay up-to-date with the course content and will give you an alternative view of the course materials. Note there are two Lab Tests based partly on the weekly Möbius lessons 61c [(s) (e<0078>J 0/TT1 s)-f 0.4511.3 (e)]TJ 0 Tc 0 Tw (1 0 0 1 0 0 Td1

Because of this, students should be aiming for a mark of 80% or greater in the Lab Tests. Marks less than 80% should be seen as a warning sign of possible failure in the course.

- The Assignment is available over an extended period and students can work on this with the benefit of all the course resources. Students who pass MATH1131/41 typically obtain a mark of at least 6 or 7 out of 10 for the Assignment.
- The average mark for pre-exam work is typically well over 40/50.
- The exam focuses on questions that require understanding rather than routine calculation. A student's pre-exam mark is not a good predictor of the exam mark. Past exams from 2020 or later are the best indication of what to expect in the exam.
- If your performance in or ability to complete any assessment is affected by illness or other reasons beyond your control, you may be eligible for special consideration. See Section 9 on page 13 for details.
- To pass MATH1131/41 you need 50% or greater overall. There is no requirement to gain any particular mark in any individual assessment items.

Weightings

The final mark will be made up as follows:

Assessment task	Weight	Course Learning Outcomes
Online		
Weekly Möbius Lessons	10%	1, 2, 3, 5, 6
Lab Tests	30%	1, 2, 3, 6
Assignment		

attempt for each Lab Test.

The Lab Tests will be conducted online in Term 1 2022. For the first of these tests, you will not need to use software such as Maple. For the second test you will need to use Maple to answer some of the questions. The second test will consist of questions from the Maple coding topics of the weekly Möbius lessons in addition to some algebra and calculus questions.

The Maple coding component of this test will be on the features of Maple which are covered in Chapter 1 and all of Chapter 2 (only up to section 11 in Chapter 2) of the First Year Maple Notes and some algebra and calculus questions from the weekly Möbius lessons. These tests will be open book, but they must be your own work and you must not have outside help. You are expected to have worked out exactly how to answer the questions before you attend the tests because you are allowed unlimited practice at the actual test questions, and you can view your results for these tests in the Möbius gradebook.

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. It will also give you practice at presenting solutions to exam style questions.
The questions will be presented to you on Möbius and you will write solutions to these questions. You will be able to check the correctness some parts of your answer using Möbius 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. The assignment deadline will be 11:59pm on Tuesday of week 8. The assignment will have a maximum mark of 10. A penalty of 5% of the maximum mark will be deducted from the awarded mark per day late up to a maximum of 5 days late. Submissions over 5 days late will receive a mark of zero .
Complete details of the process for the assignment will be provided when the assignment is released. Note the marking criteria are focused on how you explain and present your answers.

End of Term Examination

In Term 1 2022 the End of Term Examination will be conducted online.

The final exam covers material from the whole of the algebra, calculus and computing (Maple) syllabi. The best guide to the style and level of difficulty is the past exam papers. Past exam papers will be provided on Moodle. Some have worked solutions and others do not. Examination questions are, by their nature, different from the short test questions. They may test a greater depth of understanding. The questions will be longer, and sections of the course not covered in other assessments will be examined. The end of term exam may contain some parts requiring knowledge of Maple.

This term's exam will be closest in format to the 2020 and 2021 exams, which are different to exams prior to 2020. The assessment tasks during the term allow repeated attempts over an extended period and focus more on basic skills. As a result, students should be aiming for a high mark in the pre-exam assessment, and this indicates significant progress towards achieving the learning outcomes of this course. The exam is time limited and has more complex questions. Therefore, a high mark in the pre-exam assessment is not always an accurate indication of the final course mark.

Schedule of all assessments

Lectures and tutorials run during weeks 1 to 5 and 7 to 10. The table below gives the schedule all assessments.

Week	Assignment/lab tests	Weekly Möbius Lessons (MATH1141: 11am; MATH1131: 1pm)
1		Start work on your first Möbius Lesson
2		Möbius Lesson 1 due Tuesday
3		Möbius Lesson 2 due Tuesday
4	MATH1141 Lab Test 1	Möbius Lesson 3 due Tuesday

	(Wednesday 9am to Friday 11am)	
5	MATH1131 Lab Test 1 (Tuesday 9am to Thursday 1pm)	Möbius Lesson 4 due Tuesday
6	Flexibility Week	
7		Möbius Lesson 5 due Tuesday
8	Assignment due Tuesday 11:59pm MATH1141 Lab Test 2 (Wednesday 9am to Friday 11am)	Möbius Lesson 6 due Tuesday
9	MATH1131 Lab Test 2 (Tuesday 9am to Thursday 1pm)	Möbius Lesson 7 due Tuesday
10		Möbius Lesson 8 due Tuesday Möbius Lesson 9 due Sunday*
11	Monday to Thursday: Study break Friday: Start of exams – Check myUNSW for exam timetable	

* The last Möbius Lesson will remain available until Week 11 Tuesday 11am for MATH1141 and Tuesday 1pm for MATH1131.

6. Expectations of students

School and UNSW Policies

The School of Mathematics and Statistics has adopted a number of policies relating to enrolment, attendance, assessment, plagiarism, cheating, special consideration and [illegible]

It will be the best one-hour investment you've ever made.

Plagiarism

Plagiarism is presenting another person's work or ideas as your own. Plagiarism is a serious breach of ethics at UNSW and is not taken lightly. So how do you avoid it? A one-minute video for an overview of how you can avoid plagiarism can be found https://student.unsw.edu.au/plagiarism.

Detection of academic misconduct

The School of Mathematics and Statistics uses a variety of means to detect and investigate potential academic misconduct in assessments, including the use of data from University systems and websites.

7. Readings and resources

Course Pack

Your course pack should contain the following five items:

- Algebra Notes (for MATH1131/1141)
- Calculus Notes (for MATH1131/1141)
- Past Exam Papers Booklet
- First Year Maple Notes

A printed version of the course pack can be purchased from the bookshop. These items can also be downloaded from UNSW Moodle, but many students find the hardcopy more efficient for study.
NB: The Course Outline can be downloaded from Moodle or the School website only.
Information on administrative matters, lectures, tutorials, assessment, syllabuses, class tests, computing, special consideration and additional assessment.

Textbook

S.L. Salas, E. Hille and G.J. Etgen, *Calculus – One and Several Variables,* any recent edition, Wiley.
Note, the 10h Edition of the textbook above comes with access to the electronic resources known as WileyPlus. This electronic version provides internet access to the textbook, problems, worked solutions, test (for self-assessment) and other electronic resources related to the text material. If purchased from the UNSW Bookshop, you will have access to the WileyPlus server for one year; it is possible to renew the web access on a yearly basis or for one year, at a fee determined

of week 1. Please note that no appointment is necessary, this is a drop-in arrangement to obtain one-on-one help from tutors. The Drop-in Centre includes Lab Consultants who can help with Maple.

https://www.maths.unsw.edu.au/currentstudents/Mathematics-Drop-in-Centre
https://www.maths.unsw.edu.au/currentstudents/maple-lab-consultants

Additional support for students

ELISE (Enabling Library and Infor mation Skills for Everyone)

ELISE is designed to introduce new students to studying at UNSW.

Completing the ELISE tutorial and quiz will enable you to:

- analyse topics, plan responses and organise research for academic writing and other assessment tasks
- effectively and efficiently find appropriate information sources and evaluate relevance to your needs
- use and manage information effectively to accomplish a specific purpose
- better manage your time
- understand your rights and responsibilities as a student at UNSW
- be aware of plagiarism, copyright, UNSW Student Code of Conduct and Acceptable Use of UNSW ICT Resources Policy
- be aware of the standards of behaviour expected of everyone in the UNSW community
- locate services and information about UNSW and UNSW Library

Some of these areas will be familiar to you, others will be new. Gaining a solid understanding of all the related aspects of ELISE will help you make the most of your studies at UNSW.

The *ELISE* training webpages:
https://subjectguides.library.unsw.edu.au/elise/aboutelise

Equitable Learning Services (ELS)

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 (previously known as SEADU) who provide confidential support and advice.

They assist students:

http://www.lc.unsw.edu.au/services-programs

Other Supports

- The Current Students Gateway: https://student.unsw.edu.au/

Lecture	Topics	Algebra Notes
21	Properties of determinants.	5.4
22	Review	

Algebra Problem Sets

The Algebra problems are located at the end of each chapter of the Algebra Notes booklet. They are also available from the course module on the UNSW Moodle server. The problems marked [R] form a basic set of problems ZKLFK \RX VKRXOG WU\ ¿UVW 3UREOHPV PDUNHG >+@ DUH KDUGHU DQG marked [R]. You do need to make an attempt at the [H] problems because problems of this type will occur on tests and in the exam. If you have difficulty with the [H] problems, ask for help in your tutorial.

Questions marked with a [V] have a video solution available from the course page for this subject on Moodle. There are a number of questions marked [M], indicating that Maple is required in the solution of the problem.

11. Calculus Syllabus

The Calculus textbook is S.L. Salas & E. Hille and G.J. Etgen *Calculus - One and Several Variables,* any recent edition, Wiley. References to the 10th HGLWLRQ DUH VKRZQ DV 6+ 7R LPSURYH \RXU XQ theorems and proofs, the following book is recommended: Introduction to Proofs in Mathematics, J. Franklin & A. Daoud, Prentice-Hall.

In addition, for MATH1141, for help with understanding the foundations of calculus you will find the following book readable and useful: Calculus by M. Spivak (there are multiple copies in the library). References to Spivak are in the column headed SP.

In this syllabus, the references to the textbook are *not* intended as a GH¿QLWLYH list of what you will be expected to know. They are just a guide to ¿nding relevant material. Some parts of the course are not covered in the textbook and some parts of the textbook (even in the sections mentioned in the references below) are not included in the course. The scope of the course is GH¿QHG by the content of the lectures and problem sheets. The approximate lecture time for each section is given below.

Lecture	Topics	SH10	SP
Chapter 1: Sets, inequalities and functions			
1	3, :, 7, 9. Open and closed intervals. Inequalities.	1.2, 1.3	1, 2
2	Functions: sums, products, quotients, composites. Polynomials, rational functions, trig functions as examples of continuous functions. Implicitly defined functions.	1.6-1.7	3, 4
Chapter 2: Limits			
3	MATH1131: Informal definition of limit as T \ = (=finite). MATH1141: Formal definition of limit as T \ = (=finite).	2.1, 2.2 pp177-178 & 195-198	5 -

Chapter 3: Properties of continuous functions

5	Combinations of continuous functions. Intermediate Value Theorem.	2.4
6	Min-max Theorem. Relative and absolute maxima and minima	2.6, B1, B2, 4.3-4.5

Chapter 4: Differentiable functions

7	Definition of derivatives via tangents. Derivatives of sums, products, quotients and composites. Rates of change. Higher derivatives.	3.1 3.2-3.5
8	Derivatives of polynomial, rational and	

70 0 1104 -010 11.04 256.44 541.76 Tm4

	Differentiation.	
21	Exponential function as the inverse of ln, basic properties. $=^{ë}$, logs to other bases.	7.4-7.6

Chapter 10: Hyperbolic functions

22	Definitions, identities, derivatives, integrals and graphs.	7.8
	Inverse hyperbolic functions.	7.9

Remember that there will always be unscheduled periods when the computers are not working because of equipment problems and that this is not a valid excuse for not completing tests on time.

How to start

The MATH1131 module in UNSW Moodle has several short instructional videos illustrating how to access and use all the computing related components of MATH1131. The general introductory videos are in the Course Materials folder, with videos related to Maple located in the Computing component folder and those related to Möbius in the Online Assessment in Algebra, Calculus and Computing folder.

Following this you should use some of your free time in week 1 to complete the Maple introductory module in Möbius as part of the week 1 Möbius lesson. During a face-to-face teaching mode, you can go to the Red Centre lab G012 to access Maple on the School's lab computers, but for an online teaching mode you can access Maple via myAccess (see the section 'Remote access to Maple' below). For Term 1 2022, lab consultations are available from Monday to Thursday 3pm-5pm and on Friday 1pm-5pm in the same room as Drop-in Centre.

For the computers in the school laboratories, your login ID is "z" followed immediat

13. Some Greek Characters

Listed below are the Greek characters most commonly used in Mathematics.

Name	Lower case	Upper case	Name	Lower case	Upper case
Alpha	Ù		Nu	å	
Beta	Ú		Xi	æ	
Gamma	Û		Pi	è	+
Delta	Ü		Rho	é	
Epsilon	óor Ý		Sigma	ê	-
Zeta	Þ		Tau	ì	
Eta	ß		Phi	ö or î	0
Theta	à	#	Chi	ï	
Kappa	â		Psi	ð	2
Lambda	ã	&	Omega	ñ	3
Mu	ä				