Contents

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1. Staff

MATH1131 Mathematics 1A and MATH1141 Higher Mathematics 1A

Roll	Name	Email	Room*
Director of First Year	A/Prof Jonathan Kress		

3. Course information

Units of credit: 6

Exclusions for MATH1131:

The time and location of your Classroom Tutorial can be found on myUNSW. Students can change their tutorial 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.

extended period and students can work together, seek help and use any resources they wish. Most students gain a perfect score in these.

- The Lab Tests allow unlimited practice of questions from the actual question bank before the test. Because of this, students should be aiming for a mark of 80% or greater in the Lab Tests. Marks less than

These tests will be conducted in the Red-Centre labs in week 4 (first test) and week 8 (second test) for MATH1141 and in week 5 (first test) and week 9 (second test) for MATH1131. The actual times of these tests is shown in each . Each of the Lab Tests will contribute 15%. **Students will have a single attempt for each Lab Test.**

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

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 (Due Tuesdays at 11am for MATH1141 and 1pm for MATH1131)
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 (EXM class)	Möbius Lesson 3 due Tuesday
5	MATH1131 Lab Test 1 (EXM class)	Möbius Lesson 4 due Tuesday
6	Flexibility Week	
7		Möbius Lesson 5 due Tuesday
8	Assignment due Tuesday 11:59pm	Möbius Lesson 6 due Tuesday

The UNSW Student Code and the Student Misconduct Procedur

contact your Lecturer-in-charge in the first instanepn2C /

Lecture	Topics	Algebra Notes
3	Points, line segments and lines. Parametric vector equations. Parallel lines.	1.4
4	Planes. Linear combinations and the span of two vectors. Planes though the origin. Parametric vector equations for planes in $\mathbb{R}^3$. The linear equation form of a plane.	1.5
Chapter 2. Vector geometry		
5	Lengths, angles and the dot product in $\mathbb{R}^2$, $\mathbb{R}^3$, $\mathbb{R}^n$.	2.1, 2.2
6	Orthogonality and orthonormal basis, projection of one vector on another. Orthonormal basis vectors. Distance of a point to a line.	2.3
7	and arithmetic properties, geometric interpretation of cross product as perpendicular vector and area.	2.4
8	Scalar triple products, determinants and volumes. Equations of planes in $\mathbb{R}^3$ the parametric vector form, linear equation (Cartesian) form and point-normal form of equations, the geometric interpretations of the forms and conversions from one form to another. Distance of a point to a plane in $\mathbb{R}^3$.	2.5, 2.6
Chapter 3: Complex Numbers		
9	Development of number systems and of complex numbers and of complex number addition, subtraction and multiplication.	3.1, 3.2, start 3.3
10	Division, equality, real and imaginary parts, complex conjugates. Argand diagram, polar form, modulus, argument.	Finish 3.3, 3.4 3.5, 3.6
11	De Arithmetic of polar forms.	3.7, 3.7.1
12	Powers and roots of complex numbers. Binomial theorem and	3.72, 3.73 start 3.8
13	Complex polynomials. F[( )] TJETQq0.00000uttrF/MCID 41>BDC q11	

Lecture	Topics	Algebra Notes
18	General properties of solutions of ö● سي ╫	4.7, 4.8
Chapter 5: Matrices		
19	Operations on matrices. Transposes.	5.1, 5.2
20	Inverses and determinants.	5.3, 5.4
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

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 e(aF5 16 Tf1 0(0)] - reW30t 1 45.05.5 842 reW* nB/F8 10 Tf1 0 0 1 318.38 401.63 Tm0 g0(q0.000008874 0 595.5 842 reW* nBT/B20s0 g

3	MATH1131: Informal definition of limit as ώ ο ώ ώ finite). MATH1141: Formal definition of limit as ώ ο ώ ώ finite).	2.1, 2.2 pp177-178 & 195-198	5
4	Formal definition of limit as ώ ο Ь. Limit rules. The pinching theorem.	2.3, 2.5	

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. De1,		

18	Integrals on unbounded domains.	
19	Limit form of the comparison test. MATH1141: Proof of limit for of comparison test.	11.7

Chapter 9: Logarithms and exponentials

20	Ln as primitive of ρ7ὼ, basic properties, logarithmic Differentiation.	7.2, 7.3
21	Exponential function as the inverse of ln, basic properties. ὥ ὼ, logs to other bases.	7.4-7.6

Chapter 10: Hyperbolic functions

The Red-Centre labs will be open in Term 3 2022.

The main computing laboratory is Room G012 of the Red Centre. You can get to this lab by entering the building through the main entrance to the School of Mathematics (on the Mezzanine Level) and then going down the stairs to the Ground Level. A second smaller lab is Room M020, on the mezzanine level of the Red Centre.
For more information, including opening hours, see the computing facilities webpage: