UNSW SYDNEY

Course Outline

MATH1131 Mathematics 1A

MATH1141 Higher Mathematics 1A

School of Mathematics and Statistics

Faculty of Science

Semester 1, 2017

Contents

1. Staff

MATH1131 Mathematics 1A and MATH141 Higher Mathematics 1A

Lecturer-in-charge	Name	Email	Room
Course Authority	Dr Jonathan Kress	j.kress@unsw.edu.au	RC-3073
Maple computing	Dr Chi Mak	chi.mak@unsw.edu.au	RC-4073
Algebra online tutorials	Dr Joshua Capel	j.capel@unsw.edu.au	RC-5104
Calculus online tutorials	Dr Daniel Mansfield	daniel.mansfield@unsw.edu.au	RC-4070

MATH1131 Mathematics 1A

Position	Name	Email	Room
Lecturer group 1	Dr Jonathan Kress Dr Michael Feischl	j.kress@unsw.edu.au m.feischl@unsw.edu.au	RC-3073 RC-2075
Lecture group 2	Dr Daniel Mansfield Professor John Roberts	daniel.mansfield@unsw.edu.au jag.roberts@unsw.edu.au	RC-4070 RC-3065
Lecture group 3	Dr Maike Massierer Associate Professor Adelle Coster	maike@unsw.edu.au a.coster@unsw.edu.au	RC-4105 RC-2086
Lecture group 4	Mr Milan Pahor Mr Peter Brown	m.pahor@unsw.edu.au peter@unsw.edu.au	RC-3091 RC-5106

MATH141 Higher Mathematics 1A

Position	Name	Email	Room
Lecturer group 1	Dr Alina Ostafe Professor Fedor Sukochev	Alina.ostafe@unsw.edu.au f.sukochev@unsw.edu.au	RC-4078 RC-5109
Lecture group 2	Associate Professor Daniel Chan Professor Wolfgang Schief	danielc@unsw.edu.au w.schief@unsw.edu.au	RC-4104 RC-4069

Staff consultation times will be posted on Moodle and on the School of Mathematics and Statistics website on the *Current Students* > *Undergraduate* > *Student Services* > *Help for Students* page by the beginning of week 2 each semester.

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: http://www.maths.unsw.edu.au

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

- By email to fy.mathsstats@unsw.edu.au
- By phone: 9385 7011
- Or in person to the Red Centre building, level 3, room 3072 (between 9am to 12pm OR 2pm to 4pm)

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. Constructive comments on course improvement may also be emailed to the Director of First Year Mathematics, Dr 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 state your student number in all emails to the Student Services Office.**

3. Course information

Units of credit: 6

Exclusions for MATH1131: MATH1011, MATH1031, MATH1141, MATH1151, ECON1202, ECON2291

Exclusions for MATH1141: MATH1011, MATH1031, MATH1131, MATH1151, ECON1202, ECON2291

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

Handbook entry for MATH1131:
http://www.handbook.unsw.edu.au/undergraduate/courses/2017/MATH1131.html
Offered in: Semester 1 and 2

Handbook entry for MATH1141:
http://www.handbook.unsw.edu.au/undergraduate/courses/2017/MATH1141.html
Offered in: Semester 1 only

Course summary

This course will provide you with a good working knowledge of Calculus and Linear Algebra, and show how these topics can be applied in interdisciplinary contexts. Analytical thinking and problem solving are demonstrated in lecturers, and you will have an opportunity to develop your own analytical thinking and problem solving skills in tutorial classes. This course enhances your ability to solve problems using logical arguments and techniques, which are generic skills that can be applied in multidisciplinary work. The course will also engage you in independent and reflective learning through your homework problems and the Maple computing package. You are encouraged to develop your communication skills through active participation in tutorials, and by writing clear, logical arguments when solving problems.

Course aims

The aim of MATH1131/1141 is that by the time you finish the course you should understand the concepts and techniques covered by the syllabus and have developed skills in applying those concepts and techniques to the solution of appropriate problems. Successful completion of this course, together with the second semester courses MATH1231/1241, will enable you to understand the mathematics that you will meet in the later years of your program. It is also expected that students will be able to use the symbolic computing package Maple as an aid to solve problems that were generally inaccessible just a generation ago.

Course learning outcomes (CLO)

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

- state definitions as specified in the syllabus,
- state and prove appropriate theorems,
- explain how a theorem relates to specific examples,
- apply the concepts and techniques of the syllabus to solve appropriate problems,
- prove specific and general results given specified assumptions,
- use mathematical and other terminology appropriately to communicate information and understanding,
- use the symbolic computing package Maple as an aid to solve appropriate problems.

4. Learning and teaching activities

Lecturers & Tutorial Schedule

MATH1131 Mathematics 1A

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Lectures Group 1		4-5pm Alg Kress **CLB-7** 5-6pm Calc Feischl		9-10am Calc Feischl **Mathews A** 10-11am Alg Kress	
Lectures Group 2			2-3pm Alg Mansfield **Mathews A** 3-4pm Calc Roberts		10-11am Cal Roberts **Mathews A** 11-12pm Alg Mansfield
Lectures Group 3			9-10am Alg Massierer **Mathews A** 10-11am Calc Coster		2-3pm Calc Coster **Mathews A** 3-4pm Alg Massierer
Lectures Group 4	9-10am Alg Pahor **Mathews A** 10-11amCalc Brown			12-1pm Alg Pahor **CLB-7** 1-2pm Calc Brown	
Tutorials	12-1pm Calc. 1-2pm Calc. 4-5pm Calc.	9-10am Calc. 11-12pm Calc. 1-2pm Calc. 2-3pm Calc.	11-12 Calc. 2-3pm Alg. 3-4pm Alg. 4-5pm Alg.	9-10am Alg. 10-11am Alg. 4-5pm Alg.	9-10am Alg. 1-2pm Alg.

MATH1141 Higher Mathematics 1A

	Mon	Tues	Wed	Thurs	Fri
Lectures Group 1		4-5pm Alg Ostafe **Physics Th.** 5-6pm Calc Sukochev		9-10am Calc Sukochev **Physics Th.** 10-11am Alg Ostafe	
Lectures Group 2			2-3pm Alg Chan **Physics Th.** 3-4pm Calc Schief		10-11am Cal Schief **Physics Th.** 11-12pm Alg Chan
Tutorials	9-10am Calc. 10-11am Calc. 2-3pm Calc.		12-1pm Calc. 1-2pm Alg.	1-2pm Alg. 5-6pm Alg.	12-1pm Alg.

Classroom Tutorials

Students in MATH1131 and MATH1141 are enrolled in two classroom tutorials, classroom tutorial 1 (Algebra) and classroom tutorial 2 (Calculus). Classroom Tutorial 1 is timetabled in the 2nd half of the odd weeks; Classroom Tutorial 2 is timetabled in the 1st half of even weeks. Classroom tutorials commence in week 2 and run until week 13.

Please see the table below and note that a dash (-) indicates an empty time slot where there is no class to attend. The empty time slots are used for the four class tests, there are two class tests each for Calculus and Algebra. **Attendance is compulsory for all classroom tutorials** and a roll will be called at all tutorial classes. Please carefully note the table shown below – especially where class tests are scheduled.

Students are able to change their tutorials via myUNSW until the end of week 1. After that time, they can only change tutorials by going to the Student Services Office, Red Centre Building room RC-3072 with evidence of a timetable clash or work commitments.

Weeks	Calculus tutorial	Algebra tutorial
2	Classroom Tutorial	-
3	-	Classroom Tutorial
4	Classroom Tutorial	-
5	**CLASS TEST**	Classroom Tutorial
6	Classroom Tutorial	**CLASS TEST**
7	-	Classroom Tutorial
8	Classroom Tutorial	-
9	**CLASS TEST**	Classroom Tutorial
10	Classroom Tutorial	-
11	-	Classroom Tutorial
12	Classroom Tutorial	**CLASS TEST**
13	-	Classroom Tutorial

Online Tutorials

There is a weekly online tutorial due at 23:59 on Sunday at the end of every week starting from week 2. There is a detailed week-by-week schedule in the algebra notes and calculus notes, on Moodle and later in this booklet.

The online tutorials 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 on the course materials. Your best grade from 8 of the 12 online tutorials will contribute 8% of your final grade.

Note:

- Your work on these must be your own work, but you are encouraged to discuss the methods required with other students.
- Each version of an online tutorial will be slightly different.
- Only a limited number of users can have simultaneous access to Maple TA, so **do NOT** leave your work on these to the last day when the server may be busy.
- **No deadline extensions will be granted.** You should attempt these tests with sufficient remaining time to allow for unplanned services interruptions.

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: http://moodle.telt.unsw.edu.au

Here you will find announcements, general information, notes, lecture slide, classroom tutorial and homework problems and links to online tutorial and assessments.

Maple TA

Online tutorials and online assessments in this course use a system called Maple TA. Information on how to access and use Maple TA is provided on UNSW Moodle. **Note that "Maple" and "Maple TA" are different.**

Maple is the computer algebra software that you will learn how to use in the computing component of this course, and Maple TA is an online assessment system used in this course for the online tutorials and online assessments.

5. Assessment overview

The final mark will be made up as follows:

Algebra and Calculus class tests	20%
Online Algebra and Calculus tutorials	8%
Online Computing tests (Maple)	4%
Maple Laboratory Computing test	8%
End of semester exam	60%

Note:

- You will be able to view your final exam timetable once Exams Central has finalised the timetable. Please visit the web page: https://my.unsw.edu.au/student.unsw.edu.au/exams 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 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
- As from S1, 2016 students with a **final mark in the range of 45-49** will be permitted to take the Additional Assessment Exam as a Concessional Additional Assessment (AA). There will be no notification to the individual student of the right to take the Concessional AA, but the details of the

courses AA exam schedule will be provided on the School's website Notice Board, after the Provisional Results are published (normally 1 week after the exam period ends).

The final mark after completing the Concessional AA will not increase to a mark higher than 50. Website to School Notice Board: http://www.maths.unsw.edu.au/currentstudents/current-students

Class tests

Details of the dates and content of **Algebra and Calculus class tests** are given in this booklet; refer to the schedule of all class assessments on page 11 for details. The topics covered in the class tests are given on pages 22 and 28**Error! Bookmark not defined.**.

Sample copies of the tests are included in the Algebra and Calculus Notes.

Note:

- You **MUST** be enrolled in Algebra and a Calculus tutorial and YOU MUST TAKE EACH TEST IN THE CLASSROOM TUTORIAL TO WHICH YOU HAVE BEEN OFFICIAL ALLOCATED.
- To each test you **must bring** your **Student ID card**, some blank **A4 writing paper**, at least one **pen or pencil**, and a **Stapler** (so that you can staple a cover sheet to your answers).
- Normal exam conditions apply in tests.
- You will **not** be allowed to use a calculator in class tests.
- Your **best three scores** in the four tests will be counted towards your final assessments mark.
- If you miss a **class test** due to illness, please **DO NOT** apply for Special Consideration on-line. You should provide your tutor with a medical certificate in the following week so that your absence can be converted to an M grade to signify a "Medical Absence". The M grade is converted to a mark that is the average result from completed tests, and is recorded towards the end of semester. No more than two "M's" will be accepted in any one semester.
- Tutors are expected to enter class test marks within a fortnight of the test being taken. Your mark will be accessible via the "Maths & Stats Marks" link on the home page of MATH1131 or MATH1141 on the UNSW Moodle server.
- It is your responsibility to check that these marks are correct and you should keep marked tests until the end of semester in case an error has been made in recording the marks. If there is an error, either speak to your tutor or bring your test paper to the Student Services Office as soon as possible, but no later than Friday in Week 13.

Online self-paced Maple Lessons

In addition to the calculus and algebra components in lessons, there is a computing component in MATH1131/1141. Online self-paced lessons are available through UNSW Moodle. These lessons guide students through the computing component and are integrated with and enhance the lecture and tutorial content presented in calculus and algebra.

Students are expected to work through and complete the specified online lessons according to the schedule given on page 11. Associated with each lesson is a graded quiz, done in Maple TA and the completed quizzes contribute to 4% of the final grade. Learning content will be accessible at all times for learning and revision, but the online assessments will only be available for credit until the published deadlines, given on page 11**Error! Bookmark not defined.**.

More information about the Computing component is given below and later in this booklet (see page 29) and the *First Year Maple Notes 2017.* These computing notes are freely available from the MATH1131/1141 page on UNSW Moodle, and also from the School's website.

Computing consultants are available in RC-G012 from 11am to 4pm every weekday during weeks 1 to 9.

Maple Online Tests

There will be two different forms of computing tests. An initial set of 5 small online tests will run using Maple TA, followed by a laboratory based test in week 10. The online tests may be completed on any suitable web browser in your own time. You will need access to Maple (not just Maple TA) either through the myAccess service or in the Red-Centre labs. These online Maple computing tests are linked to the self-paced Maple lessons in UNSW Moodle.

Details on using Maple TA for online tests can be found on UNSW Moodle. The deadlines for these tests are given below. After a test's deadline, a "revision only" version of the test (that does **not** count towards your final mark), will become available. These online Maple computing tests **must be passed in sequence**. For example, you must pass "Maple Online Test 1" or "Maple Online Test 1 (revision only)" to gain access to "Maple Online Test 2" and "Maple Online Test 2 (revision only)".

You will have an unlimited number of attempts at these online computing tests. Note that it is only your best mark on each test that counts towards your final grade but marks from the "revision only" versions do not count.

Note: Do not leave your online attempts until the last day! Your inability to complete the online tests due to congestion in the School computing labs or in Maple TA on the last day will **NOT** be accepted as an excuse for missing the deadlines.

The deadlines for completion of the **online Maple tests** for MATH1131/1141 are shown in the Schedule of all class assessments **on page 11.**

Maple Laboratory Test

The additional Maple lessons 6 and 7 are designed to assist you with preparation for the Maple laboratory test **in week 10.** There is an Online Maple Test corresponding to lessons 6 and 7, but it does not count directly towards your MATH1131/1141 final grade.

All computing tests are linked to the Algebra and Calculus material, so you should make sure you understand the course work before trying them. The end of semester exam may contain one or two sub-questions requiring knowledge of Maple.

You must book for the test using the booking link that will be provided on UNSW Moodle, and you must bring your UNSW Student ID card to the test. Bookings must be made using the "Maple Lab Test Booking" link in Moodle. This should be available in week 8 of semester. If you believe the proposed times will be impossible for you, inform the Lecturer-in-Charge for Computing immediately.

The 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 2017.

You will NOT need to remember the exact syntax of each command because you will have access to the following resources during the test:

- the First Year Maple Notes (in PDF);
- the self-paced lessons from Moodle; and,
- Maple's in built help pages.

You will not have access to the internet during the test and are NOT allowed to bring any calculators, notes or writing materials (pens, pencils, paper) into the test.

All of the possible test problems are provided in your MATH1131 and MATH1141 Maple TA classes. There you will also find a practice test with the same format as the actual Maple Lab Test. You are allowed an unlimited number of attempts at the practice tests.

You are expected to have worked out exactly how to answer the questions before you attend the test because you are allowed unlimited practice at the actual test questions, and you can view your results for these tests in the Maple TA gradebook.

End of Semester Examination

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. The course pack contains a book of past exam papers with worked solutions. To see the exact form of the past exam papers, including instructions on the front cover and the tables of integrals and standard normal probabilities that are provided, search for "MATH1131" or "MATH1141" on the library website. Examination questions are, by their nature, different from short test questions. They may test a greater depth of understanding. The questions will be longer, and sections of the course not covered in the class tests will be examined.

Please note that the Algebra Syllabus changed in 2012. Chapter 9, on Statistics and Probability was rewritten and contains some material that is different from previous years. Please note this carefully when you look at past exams and revising.

The end of semester exam may contain one or two sub-questions requiring knowledge of Maple.

Additional information for MATH1141 Higher Mathematics 1A

Content: Higher Mathematics 1A includes everything which is in the MATH1131 course and this accounts for 85% of the content of the Higher course. The remaining time is spent treating some of the common topics in greater depth and covering some extra topics. This booklet contains separate Calculus syllabuses for MATH1131 and MATH1141. For Algebra there is a syllabus for MATH1131 and a list of extra topics for MATH1141.

Problem sets: The basic problem sets for MATH1141 are the same for MATH1131, but you should pay special attention to the problems labelled [H] and [X] because they are particularly intended for the Higher course. It is also important to work through all the [R] labelled questions to make sure you get adequate practice on more routine problems.

Assessment: Marks in Higher Mathematics 1A will be scaled so that students in the Higher course are not at any disadvantage compared to students in the ordinary course MATH1131. The online preparation tests, class tests and computing tests for MATH1141 are the same as those for MATH1131. However, the MATH1141 final exam will contain questions that a quite different from those in the MATH1131 exam. Note that there are two complete questions common to MATH1131 and MATH1141 in the exam.

Schedule of all class assessments

Lectures run during weeks 1 to 12, and tutorials run during weeks 2 to 13. The table below gives the schedule of class tests and computing assessments and the Online Maple Tests. There are also Online Tutorials due at 23:59 on Sunday at the end of each week from week 2 to week 13.

Week	Algebra	Calculus	Maple Computing
Week 1			
Week 2			
Week 3			
Week 4			
Week 5		**Calculus class test 1**	**Online Maple Tests 1 & 2 due** 23:59 on Sunday at end of week
Week 6	**Algebra class test 1**		

Week 7			**Online Maple Tests 3 & 4 due** 23:59 on Sunday at end of week
Mid-semester break			
Week 8			
Week 9		**Calculus class test 2**	
Week 10			**Test in Laboratory (Maple)**
Week 11			
Week 12	**Algebra class test 2**		
Week 13			
End of semester examination – check UNSW exam timetable for details **Web link: https://student.unsw.edu.au/exam-timetable**			

Calculator Information

For end of semester UNSW exams, students must supply their own calculator. Only calculators on the UNSW list of approved calculators may be used in the end of semester exams. Before the exam period, calculators must be given a "UNSW approved" sticker, obtained from the School of Mathematics and Statistics Office, and other student or Faculty centres. The UNSW list of calculators approved for use in end of semester exams is available at: https://student.unsw.edu.au/exams

6. 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.

7. 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/presenting

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

Course Pack

Your course pack should contain the following four items:

1. *Course Outline*

   Information on administrative matters, lectures, tutorials, assessment, syllabuses, class tests, computing, special consideration and additional assessment.
2. *Algebra Notes (for MATH1131/1141)*
3. *Calculus Notes (for MATH1131/1141)*
4. *Past Exam Papers Booklet*

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.

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 by the publisher. Note that these WileyPlus electronic resources are provided by the publisher John Wiley, and **not** by the School of Mathematics and Statistics. Any difficulty that you might experience with WileyPlus must be resolved with the publisher.

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 is displayed on the same Notice Board as timetables, near the School Office (room 3070, Red Centre), it is also available from the web page: http://www.maths.unsw.edu.au/currentstudents/consultation-mathematics-staff

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

Mathematics Drop-in Centre

The Maths drop-in centre provides free help to students with certain first and second year mathematics courses. First year courses supported are Math1011, Math1031, Math1081, Math1131, Math1141 and Math1151. The Maths drop-in centre office is located in RC-3064, and opening times during semester is from 10am – 12pm and 1pm to 3pm from Mondays to Fridays. The Maths drop-in centre schedule will be available on the Schools website: https://www.maths.unsw.edu.au/currentstudents/Mathematics-Drop-in-Centre 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.

Lab Consultants

For help with the Maple computing component of the first year courses, consultants will be available in the Red Centre lab RC-G012B from 11am to 4pm each teaching day in weeks 1 to 9. For more details, visit website: http://www.maths.unsw.edu.au/currentstudents/maple-lab-consultants

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
- Disability Support Services: https://student.unsw.edu.au/disability-services
- UNSW IT Service Centre: https://www.it.unsw.edu.au/students/index.html

Applications for Special Consideration

If you feel that your performance in, or attendance at a final examination has been affected by illness or circumstances beyond your control, or if you missed the examination because of illness or other compelling reasons, you may apply for special consideration. Such an application may lead to the granting of Additional Assessment.

It is essential that you take note of the rules 1, 2, 5 and 6, which apply to applications for special consideration in all first year Mathematics courses. Rules 3 and 4 apply to the above courses only.

1. Within 3 days of the affected examination, or at least as soon as possible, you must submit a request for Special Consideration to UNSW Student Central **ON-LINE** with supporting documentation attached.

Visit website to Apply for Special Consideration: https://student.unsw.edu.au/special-consideration

2. Please do not expect an immediate response from the School. All applications will be considered together. See the information below.

3. If you miss a **class test** due to illness or other problems, then you should provide the appropriate documentation to your tutor who will record an M. No more than two "M's" will be accepted in any one semester. **DO NOT apply on-line** for Special Consideration for class tests or for on-line or computing tests.

4. If your course involves a Maple/Matlab lab test which you missed, you should contact the lecturer in charge of computing as soon as possible. A resit will be organised for later in the session.

5. **You will NOT be granted Additional Assessment in a course if your performance in the course** (judged by attendance, class tests, assignments and examinations) **does not meet a minimal standard**. A total mark of greater than 40% on all assessment not affected by a request for Special Consideration will normally be regarded as the minimal standard for award of Additional Assessment.

6. It is YOUR RESPONSIBILITY to find out from the School of Mathematics and Statistics, whether you have been granted Additional Assessment and when and where the additional assessment examinations will be held. Do NOT wait to receive official results from the university, as these results are not normally available until after the Mathematics Additional Assessment Exams have started.

Information about award of Additional Assessment and a provisional list of results will be made available on the Maths & Stats Marks page later in the semester. A link to the Maths & Stats Marks page is provided on Moodle.

7. **The Additional Assessment exams for MATH1131 / MATH1141 will be held on Monday 17th and Tuesday 18th July, 2017.** A link to the Additional Assessment timetable, including locations, will be placed on the Current Students Notice Board under heading "Special Consideration and Additional Assessment" information. Web link: http://www.maths.unsw.edu.au/currentstudents/current-students

8. If you have two Additional Assessment examinations scheduled for the same time, please consult the Student Services Office either by email or phone (fy.mathsstats@unsw.edu.au or 9385 7011), so that special arrangements can be made.

9. You will need to produce your UNSW Student Card to gain entry to the Additional Assessment examination.

Important Notes

- The Additional Assessment exam may be of a different form to the original exam and must be expected to be at least as difficult.

- If you believe your application for Special Consideration has not been processed, you should immediately consult the Director for First Year Mathematics, Dr Jonathan Kress (Room 3073, Red Centre).

- If you believe that the above arrangements put you at a substantial disadvantage, you should send full documentation of the circumstances to: Director of First Year Mathematics, School of Mathematics and Statistics, University of NSW, Sydney NSW 2052, at the earliest possible time.

- 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 Disability Support Services who provide confidential support and advice. Their web site is: https://student.unsw.edu.au/disability

  Disability Support Services (DSS) 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 DSS.

- Additionally, if you have suffered misadventure during semester then you should provide full documentation to the Director of First Year Mathematics as soon as possible. In these circumstances it may be possible to arrange discontinuation without failure or to make special examination arrangements.

  Professor B Henry
  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. 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.
- 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: www.lc.unsw.edu.au/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.

10. Algebra Syllabus

The algebra course for MATH1131 is based on the MATH1131 Algebra Notes that are included in the Course Pack.
Please note that the order of the syllabus changed in 2014, in accordance with requests from the Engineering Faculty and the School of Physics. It is important to note this in regard to the class tests from previous years.

The computer package Maple will be used in the algebra course. An introduction to Maple is included in the booklet *Computing Laboratories Information and First Year Maple Notes 2017.*

The lecture timetable is given below. Lecturers will try to follow this timetable, but some variations may be unavoidable.

Chapter 1. Introduction to Vectors

Lecture 1. Vector quantities and $\mathbb{R}^n$. (Section 1.1,1.2).
Lecture 2. R^2 and analytic geometry. (Section 1.3).
Lecture 3. Points, line segments and lines. Parametric vector equations. Parallel lines.(Section 1.4).
Lecture 4. Planes. Linear combinations and the span of two vectors. Planes though the origin. Parametric vector equations for planes in $\mathbb{R}^n$. The linear equation form of a plane. (Section 1.5).

Chapter 2. Vector Geometry

Lecture 5. Length, angles and dot product in $\mathbb{R}^2, \mathbb{R}^3, \mathbb{R}^n$. (Sections 2.1,2.2).
Lecture 6. Orthogonality and orthonormal basis, projection of one vector on another. Orthonormal basis vectors. Distance of a point to a line. (Section 2.3).
Lecture 7. Cross product: definition and arithmetic properties, geometric interpretation of cross product as perpendicular vector and area (Section 2.4).
Lecture 8. Scalar triple products, determinants and volumes (Section 2.5). 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 $\mathbb{R}^3$. (Section 2.6).

Chapter 3. Complex Numbers

Lecture 9. Development of number systems and closure. Definition of complex numbers and of complex number addition, subtraction and multiplication. (Sections 3.1, 3.2, start Section 3.3).
Lecture 10. Division, equality, real and imaginary parts, complex conjugates. (Finish 3.3, 3.4).
Lecture 11. Argand diagram, polar form, modulus, argument. (Sections 3.5, 3.6).
Lecture 12. De Moivre's Theorem and Euler's Formula. Arithmetic of polar forms. (Section 3.7, 3.7.1).
Lecture 13. Powers and roots of complex numbers. Binomial theorem and Pascal's triangle. (Sections 3.7.2, 3.7.3, start Section 3.8).
Lecture 14. Trigonometry and geometry. (Finish 3.8, 3.9).
Lecture 15. Complex polynomials. Fundamental theorem of algebra, factorization theorem, factorization of complex polynomials of form $z^n - z_0$, real linear and quadratic factors of real polynomials. (Section 3.10).

Chapter 4. Linear Equations and Matrices

Lecture 16. Introduction to systems of linear equations. Solution of 2×2 and 3×3 systems and geometrical interpretations. (Section 4.1).
Lecture 17. Matrix notation. Elementary row operations. (Sections 4.2, 4.3).
Lecture 18. Solving systems of equations via Gaussian elimination. (Section 4.4)
Lecture 19. Deducing solubility from row-echelon form. Solving systems with indeterminate right hand side. (Section 4.5, 4.6).
Lecture 20. General properties of solutions $A\mathbf{x} = \mathbf{b}$. (Section 4.7). Applications. (Section 4.8) or Matrix operations (start Section 5.1)

Chapter 5. Matrices

Lecture 21. Operations on matrices. Transposes. (Sections 5.1, 5.2).
Lecture 22. Inverses and definition of determinants. (Section 5.3 and start Section 5.4).
Lecture 23. Properties of determinants. (Section 5.4).

Extra Algebra Topics for MATH1141

Extra topics for MATH1141 in semester 1 may be selected from the following:

Introduction to Vectors: Use of vectors to prove geometric theorems; parametric vector equations for rays, line segments, parallelograms, triangles; elements of vector calculus.

Vector Geometry: Use of vectors to prove geometric theorems, further applications of vectors to physics and engineering.

Complex Numbers: Cardan's formula for roots of cubics, applications of complex numbers to vibrating systems.

Linear Equations: Elementary matrices and elementary row operations, applications of linear equations and matrices to electrical engineering (Kirchho_'s Laws), economics (Leontief model).

Matrices and Determinants: Rotations of Cartesian coordinate systems and orthogonal matrices, evaluation of special determinants and connections with areas.

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 which you should try first. Problems marked [**H**] are harder and can be left until you have done the 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.

Weekly Algebra Schedules

Solving problems and writing mathematics clearly are two separate skills that need to be developed through practice. We recommend that you keep a workbook to practice *writing* solutions to mathematical problems. The following table gives the range of questions suitable for each week. In addition, it suggests specific recommended problems to do before your classroom tutorials.
The Online Tutorials will develop your problem solving skills, and give you examples of mathematical writing.

Weekly Algebra Homework Schedule

Week	Try to do up to		Recommended Homework Problems
	Chapter	Problem	
1	No tutorial, but start learning how to use Maple and Maple TA		
2	1	30	1, 4, 5, 6(a), 16(a), 18, 21
3	1	50	31(d), 33(b), 34(b), 41(b), 41(d), 46
4	2	17	1(b), 3, 8, 9(b)
5	2	32	14(b), 17(b), 25(a), 27(a), 29(a), 30(b)
6	3	17 (Test 1)	1(b), 5, 8(c), 10
7	3	49	18, 21(a)-21(d), 26, 27, 33(a), 34(a), 40
8	3	82	51, 54, 60(a), 61(b), 68(b), 72
9	3 4	91 11	84 5,7,10
10	4	24	12(g), 13(b), 14(c), 16(e), 17, 22(a)
11	4	45	26, 27, 31, 40
12	5	18 (Test 2)	1, 7,13, 15
13	5	57	19(a), 19(c),20, 23, 26, 35, 39

Weekly MATH1131 Algebra Tutorial Schedule

The main reason for having tutorials is to give you a chance to tackle and discuss problems which you find difficult or don't fully understand.
Content from the Algebra side of the course is covered by two kinds of tutorials: Online and Classroom. Algebra Online Tutorials are delivered using Maple TA with a discussion forum on Moodle. These can be completed from home, are available for a two week period, and are due on Sunday night in weeks 2, 4, 6, 8, 10 and 12. Algebra Classroom tutorials are delivered in a classroom by an algebra tutor. The topics covered in a classroom tutorial are flexible, and you can (and should) ask your tutor to cover any homework topics you find difficult. You may also be asked to present solutions to homework questions to the rest of the class.

The following table lists the topics covered in each tutorial.

Week	Location	Topics Covered
1	None	
2	Online	1.1 : Vector quantities 1.2 : Vector quantities and $\mathbb{R}^n$ 1.3 : $\mathbb{R}^n$ and analytic geometry
3	Classroom	1.4 : Lines Planes 1.5 : Planes
4	Online	2.1 : Lengths 2.2 : The dot product 2.3 : Applications: orthogonality and projection 2.4 : The cross product, up to question 17

5	Classroom	2.4 : The cross product, from question 18 2.5 : Scalar triple product and volume 2.6 : Planes in $\mathbb{R}^3$
6	Online	3.1 : A review of number systems 3.2 : Introduction to complex numbers 3.3 : The rules of arithmetic for complex numbers 3.4 : Real parts, imaginary parts and complex conjugates
7	Classroom	3.5 : The Argand diagram 3.6 : Polar form, modulus and argument 3.7 : Properties and applications of the polar form
8	Online	3.8 : Trigonometric applications of complex numbers 3.8 : Geometric applications of complex numbers 3.10 : Complex polynomials
9	Classroom	3.11 : Appendix: A note on proof by induction 4.1 : Introduction to linear equations 4.2 : Systems of linear equations and matrix notation 4.3 : Elementary row operations
10	Online	4.4 : Solving systems of equations 4.5 : Deducing solubility from row-echelon form 4.6 : Solving $A\mathbf{x} = \mathbf{b}$ for indeterminate $\mathbf{b}$
11	Classroom	4.7 : General properties of the solution of $A\mathbf{x} = \mathbf{b}$ 4.8 : Applications
12	Online	5.1 : Matrix arithmetic and algebra 5.2 : The transpose of a matrix
13	Classroom	5.3 : The inverse of a matrix 5.4 : Determinants

Weekly MATH1141 Algebra Tutorial Schedule

MATH1141 Tutorials cover the same material as MATH1131, only in greater detail. The tutorial structure is more flexible, which is designed to allow for classroom discussion. Only a subset of the recommended discussion questions will be discussed in your classroom tutorial, which are held every odd week starting in week 3. Online Tutorial questions for algebra are due at Sunday 23:59 every even week.

Weeks	Chapter	Online Tutorial	Recommended Classroom Discussion Questions
2 and 3	1	1, 5, 18, 41(d)	4, 6(a), 16(a), 21, 31(d), 33(b), 34(b), 41(b), 46
4 and 5	2	3, 9(a), 17(b), 7(a)	1(b), 8, 9(b), 14(b), 25(a), 29(a), 30(b)
6 and 7	3	5, 8(b), 17, 22	1(b), 10, 21(a-d), 26, 27, 31, 33(a), 34(a), 41
8 and 9	3 4	40. 60(b), 74 3	51, 54, 61(b), 68(b), 72 5,7,10
10 and 11	4	14(e),17, 21, 34	12(g), 13(b), 16(e), 22(a), 26, 27, 31, 40
12 and 3	5	7, 15, 28, 38	1, 13, 19(a), 19(c), 20, 23, 26, 35, 39

Algebra Class Tests

Questions for the class tests in MATH1131/1141 will be similar to the questions marked [**R**] and [**H**] in the problem sets. Since each class test is only twenty or twenty-five minutes in length only shorter straight forward tests of theory and practice will be set. As a guide, see the recent past class test papers (at the end of the Algebra notes).
The following table shows the week in which each test will be held and the topics covered.

Test	Week	Topics covered	
		chapter	**sections**
1	6	1	All
		2	Up to and including §2.4
2	12	3	All
		4	All

Please note that the order of the syllabus has changed in 2014. The SAMPLE TESTS contained in the Algebra Notes are based on this new syllabus, but please be aware that Sample Tests from previous years may not be relevant.
Examination questions are, by their nature, different from short test questions. They may test a greater depth of understanding. The questions will be longer, and sections of the course not covered in the class tests will be examined. As a guide, see the recent past exam papers in the separate past exam papers booklet.

11. Calculus Syllabus for MATH1131 Mathematics 1A

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 and 9th editions are shown as SH10 and SH9. To improve your understanding of definitions, theorems and proofs, the following book is recommended: *Introduction to Proofs in Mathematics,* J. Franklin & A. Daoud, Prentice-Hall.

In this syllabus the references to the textbook are *not* intended as a definition of what you will be expected to know. They are just a guide to finding 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 defined by the content of the lectures and problem sheets. The approximate lecture time for each section is given below. References to the 9th and 10th editions of Salas & Hille are shown as SH9 and SH10.

	SH10	**SH9**
1. **Sets, inequalities and functions.** (2.5 hours)		
$\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}$ Open and closed intervals. Inequalities.		
Functions: sums, products, quotients, composites.	1.2, 1.3	1.2,1.3
Polynomials, rational functions, trig functions as examples of continuous functions.		
Implicitly defined functions.	1.6-1.7	1.6-1.7
2. **Limits.** (2 hours)	**SH10**	**SH9**
Informal definition of limits as $x \to a$ (a finite)	2.1, 2.2	2.1, 2.2
Formal definition of limit $x \to \infty$	pp177-178	pp222-224
Limit rules. The pinching theorem.	2.3, 2.5	2.3, 2.5
3. **Properties of continuous functions.** (1.5 hours)		
Combinations of continuous functions.	2.4	2.4
Intermediate value and min-max theorems.	2.6, B1,B2	2.6, B1, B2
Relative and absolute maxima and minima.	4.3-4.5	4.3-4.5
4. **Differentiable functions.** (2 hours)		
Definition of derivatives via tangents.	3.1	3.1
Derivatives of sums, products, quotients and composites. Rates of change. Higher derivatives.	3.2-3.5	3.2, 3.5
Derivatives of polynomial, rational and trig functions.	3.5, 3.6	3.5, 3.6
Implicit differentiation, fractional powers.	3.7	3.7
5. **The mean value theorem and applications.** (2 hours)		
Mean value theorem and applications.	4.1,4.2	4.1,4.2
L'Hôpital's rule.	11.5,11.6	10.5,10.6
6. **Inverse functions.** (1.5 hours)		
Domain, range, inverse functions, the inverse function theorem.	7.1, B3	7.1, B3
Inverse trig functions, their derivatives and graphs.	7.7	7.7
7. **Curve sketching.** (3 hour)		
Use of domain, range, intercepts, asymptotes, Even or odd, calculus.	4.7, 4.8	4.7, 4.8

Parametrically defined curves.		
Relation between polar and Cartesian coordinates.	10.2	9.3
Sketching curves in polar coordinates.	10.3	9.4
8. **Integration.** (5 hours)		
Riemann sums, the definite integral and its algebraic properties.	5.1, B5	5.1, B5
Indefinite integrals, primitives and the two fundamental theorems of calculus.	5.2-5.5	5.2-5.5
Integration by substitution and by parts.	5.6, 8.2	5.6, 8.2
Integrals on unbounded domains, limit form of Comparison test.	11.7	10.7
9. **Logarithms and exponentials.** (2 hours)		
ln as primitive of $1/x$, basic properties, logarithmic differentiation.	7.2, 7.3	7.2, 7.3
Exponential function as the inverse of ln, basic properties. a^x, logs to other bases.	7.4-7.6 7.4-7.6	7.4-7.6 7.4-7.6
10. **Hyperbolic functions** (1.5 hours)		
Definitions, identities, derivatives, integrals and graphs	7.8	7.8
Inverse hyperbolic functions.	7.9	7.9
Integrals involving hyperbolic or trig substitution.		
11. **Review.** (1 hour)		

Calculus Syllabus for MATH1141 Mathematics 1A

This is the syllabus for *Higher* Mathematics 1.

The Calculus textbook is S.L. Salas & E. Hille *Calculus - One and Several Variables*, any recent edition, Wiley. References to the 10th and 9th editions are shown as SH10 and SH9. 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 definition of what you will be expected to know. They are just a guide to finding 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 defined by the content of the lectures and problem sheets. The approximate lecture time for each section is given below.

	SH10	**SH9**	**Sp**
1. **Sets, inequalities and functions.** (2 hours)			
$\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}$ Open and closed intervals. Inequalities.	1.2, 1.3	1.2,1.3	1, 2
Functions: sums, products, quotients, composites.			3, 4
Polynomials, rational functions, trig functions as examples of continuous functions.	1.5-1.7	1.5-1.7	
Implicitly defined functions.			
2. **Limits.** (2.5 hours)	**SH10**	**SH9**	

Formal definition of limits as $x \to a$ (a finite)	2.1, 2.2	2.1, 2.2	5
Formal definition of limits as $x \to \infty$	pp177-178 pp195-198	pp222-224 pp243-245	
Limit rules. The pinching theorem.	2.3, 2.5	2.3, 2.5	
3. **Properties of continuous functions.** (1.5 hours)			
Combinations of continuous functions.	2.4	2.4	
Intermediate value and min-max theorems.	2.6, B1,B2	2.6, B1, B2	
Relative and absolute maxima and minima.	4.3-4.5	4.3-4.5	
4. **Differentiable functions.** (2 hours)			
Definition of derivatives via tangents.	3.1	3.1	
Derivatives of sums, products, quotients and composites. Rates of change. Higher derivatives.	3.2-3.5	3.2, 3.5	
Derivatives of polynomial, rational and trig functions.	3.5, 3.6	3.6	
Implicit differentiation, fractional powers.	3.7	3.7	
5. **The mean value theorem and applications.** (2 hours)			
Mean value theorem and applications.	4.1,4.2	4.1,4.2	11
L'Hôpital's rule.	11.5,11.6	10.5,10.6	11
6. **Inverse functions.** (2 hours)			
Domain, range, inverse functions, the inverse function theorem.	7.1, B3	7.1, B3	12
Inverse trig functions, their derivatives and graphs.	7.7	7.7	
7. **Curve sketching.** (3 hours)			
Odd and even functions, periodicity, calculus.			
Use of domain, range, intercepts, asymptotes, periodicity	4.7, 4.8	4.7, 4.8	
Symmetry and calculus			
Parametrically defined curves.			
Relation between polar and Cartesian coordinates.	10.2	9.3	
Sketching curves in polar coordinates.	10.3	9.4	
8. **Integration.** (5 hours)			
Riemann sums, the definite integral and its algebraic properties.	5.1, B5	5.1, B5	13
Indefinite integrals, primitives and the two fundamental theorems of calculus.	5.2-5.5	5.2-5.5	14
Integration by substitution and by parts.	5.6, 8.2	5.6, 8.2	18
Improper integrals, limit form of Comparison test.	11.7	10.7	
9. **Logarithms and exponentials.** (2 hours)			
ln as primitive of $1/x$, basic properties, logarithmic differentiation.	7.2, 7.3	7.2, 7.3	
Exponential function as the inverse of ln, basic properties.			
a^x, logs to other bases.	7.4-7.6 7.4-7.6	7.4-7.6 7.4-7.6	
10. **Hyperbolic functions** (1.5 hours)			

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

11. **Review.** (1 hour)

Calculus Problem Sets

The Calculus problems are located at the end of each chapter of the Calculus Notes booklet. They are also available from the course module on the UNSW Moodle server. Some of the problems are very easy, some are less easy but still routine and some are quite hard. To help you decide which problems to try first, each problem is marked with an [**R**], an [**H**] or an [**X**]. The problems marked [**R**] form a basic set of problems which you should try first. Problems marked [**H**] are harder and can be left until you have done the problems marked [**R**]. Problems marked [**V**] have a video solution available on Moodle.

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. Remember that working through a wide range of problems is the key to success in mathematics.

Weekly Calculus Schedule

Solving problems and writing mathematics clearly are two separate skills that need to be developed through practice. We recommend that you keep a workbook to practice *writing* solutions to mathematical problems. The following table gives the range of questions suitable for each week. In addition it suggests specific recommended problems to do before your classroom tutorials.

Weekly Calculus Homework Schedule

Week	Try to do up to		Recommended Homework Problems
	Chapter	Problem	
1	No tutorial, but do the Revision problems.		
2	1	19	4(e), 5(d), 10(h), 12, 13(e), 15, 17
3	2	15	2(b), 3(b), 5, 12(b)
4	3	10	3, 6, 9(a), 9(c), 10(a), 10(b)
5	4	18 (Test 1)	2(d), 8(d), 9(b), 12(a), 17
6	5	15	1(b), 3, 4(b), 7(a), 10(b)
7	5	27	16, 20(c), 21(d),26
8	6	18	1, 5,8(b), 8(d), 8(f), 11(b)
9	7	20 (Test 2)	2(b), 7(c), 8(b), 14(c), 17(c)
10	8	17	5(a), 12(a), 12(b), 15(d), 16(d)
11	8	29	18(b), 19(d), 22(b),24(a)
12	9	10	2(a), 3(b), 4(e), 5(a), 8(c), 9(e), 9(h)
13	10	13	2(b), 3(a), 7(c), 8

The main reason for having tutorials is to give you a chance to tackle and discuss problems which you find difficult or don't fully understand.

The Calculus side of the course is covered by two kinds of tutorials: Online and Classroom. Calculus Online Tutorials are delivered using Maple TA with a discussion forum on Moodle. These can be completed from home, are available for a two week period, and are due on Sunday night in weeks 3, 5, 7, 9, 11 and 13. Calculus Classroom Tutorials are delivered in a classroom by a calculus tutor. The topics covered in a classroom tutorial are flexible, and you can (and should) ask your tutor to cover any topics you find difficult. You may also be asked to present solutions to homework questions to the rest of the class.

The following table lists the topics covered in each tutorial.

Weekly MATH1131 Calculus Tutorial Schedule

Week	Location	Topics Covered
1	None	
2	Classroom	Chapter 1 : Sets, inequalities and functions
3	Online	Chapter 2 : Limits
4	Classroom	Chapter 3 : Properties of continuous functions
5	Online	Chapter 4 : Differentiable functions
6	Classroom	Chapter 5 : The mean value theorem and applications, up to 5.7 : Critical points, maxima and minima
7	Online	5.8 : Counting zeros 5.9 : Antiderivatives 5.10 : L'Hôpital's rule
8	Classroom	Chapter 6 : Inverse functions
9	Online	Chapter 7 : Curve sketching
10	Classroom	Chapter 8 : Integration, up to 8.8 : Integration by substitution
11	Online	8.9 : Integration by parts 8.10 : Improper integrals 8.11 : Comparison tests for improper integrals 8.12 : Functions defined by an integral
12	Classroom	Chapter 9 : The logarithmic and exponential functions
13	Online	Chapter 10 : The hyperbolic functions

Weekly MATH1141 Calculus Tutorial Schedule

Weeks	Chapter	Online Tutorial	Recommended Classroom Discussion Questions
2	1	-	4(e), 5(d), 10(h), 12, 13(e), 15, 17
3 and 4	2 3	1(e),14 6, 10(a)	2(b), 3(b), 5, 12(b), 13(a) 3, 9(a), 9(c), 10(b)
5 and 6	4 5	6, 11, 16 4(c)	2(d), 8(d), 9(b), 12(a), 17 1(b), 3, 7(a), 10(b)
7 and 8	5 6	17, 25 1, 13	16, 19, 20(c), 21(d), 26 5, 8(b), 8(d), 8(f), 11(b)
9 and 10	7 8	5(b), 18 1, 12(a)	2(b), 7(c), 8(b), 14(c), 16(a), 17(c) 5(a), 12(b), 15(d), 16(d)
11 and 12	8 9	22(a), 28 7, 9(a)	18(b), 18(e), 19(c), 19(d), 22(b), 24(a) 2(a), 3(b), 4(e), 5(a), 8(c), 9(e), 9(h)
13	10	1(b), 6, 10(b), 12(a)	

Calculus Class Tests

The tests will take place in tutorials in the following weeks:

Test 1 Week 5.

Test 2 Week 9.

Test 1 and Test 2 will cover sections of the syllabus as shown in the table below. The test questions will be similar to the questions marked [**R**] and [**H**] in the Calculus Problems booklet.

Test	Syllabus sections	[**R**] and [**H**] problems in
1	1, 2 and 3	Chapters 1–3
2	4, 5 and 6	Chapters 4–6

It is important to note that:

- The class tests do not cover the whole syllabus.
- Questions in the exams may be very different from those in the class tests.

12. Computing Information

How much?

In MATH1131/1141 there are online computing tests worth 4% of your final mark and there will be a laboratory test, in week 10 worth 8% of your final mark. Further, there will be exam questions worth at least another 3% of your final mark so in total 15% of your final mark is derived from the computing component of the course. The Computing component depends on the other components and will require knowledge of the appropriate Algebra and Calculus.

Aim

The aim of the Computing component is twofold.

- Firstly, you will use the Symbolic Computing Package called Maple to do some mathematics on the computer. This use of Maple is integrated with the Algebra and Calculus and is designed to enhance your understanding of the mathematics involved, as well as letting you use Maple as a tool to do the mathematics. You will find the skills you acquire and things you learn useful in many other subjects you study, both within and outside the School of Mathematics. Maple enables you to tackle larger, harder and more realistic mathematical problems as it can handle all the difficult algebra and calculus for you. Furthermore, learning some Maple introduces you to some of the basic ideas in computer programming.
- Secondly, you will gain some experience in teaching yourself how to use a complicated computing package. This is a skill that will be needed in other courses at UNSW and in the workforce.

Computing lab

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.

The laboratories will normally be open as follows:

	Days	**M020**	**G012**
During Semester	Monday to Friday	9am to 9pm	9am to 9pm
Week 10:		9am to 9pm	**Closed**
	Saturdays & Sundays	Closed	Closed
Public holidays & Weekends		Closed	Closed

Any changes to these times will be posted on the door of Room M020.

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 / 1141 module in UNSW Moodle has several short instructional videos illustrating how to access and use all the computing related components of MATH1131 / 1141. The general introductory videos are located in the Course Materials folder, with videos related to Maple located in the Computing component folder and those related to Maple TA in the Online Assessment in Algebra, Calculus and Computing folder.

Following this you should use some of your free time in week 1 go to the Red Centre lab G012 and complete the Maple introductory module and in Maple TA you should complete the assignment “Using Maple TA”. Consultants will be on duty from 12noon to 4pm each day to help you get started with these tasks.

For the computers in the school laboratories, your login ID is “z” followed immediately by your seven digit student number and your password is your zPass, issued to you at enrolment. If you have difficulties logging in, the computers will allow a five minute login with ID “new user” and password “new user” where you can access https://idm.unsw.edu.au and reset or unlock your zPass. Be aware that two consecutive failed login attempts will lock you out of the computing system for 30 minutes, or until you reset or unlock your zPass.

From week 1 onwards, you are expected to master Chapter 1 and sections 2.1 to 2.11 in the First Year Maple Notes 2016 by completing the self-contained Maple learning modules and by obtaining help, if necessary, from the Consultants who will be available in Room G012 from 12noon to 4pm each weekday of weeks 1 to 9.

Computing syllabus

The Maple computing component is taught via a series of self-paced modules located in UNSW Moodle You are expected to work steadily through these modules, completing the quiz at the end of each module before moving on to the next module. The timetable for the completion of these small tests is explained in detail in the section on computing tests on page 8 and is clearly visible in Maple TA.

The online teaching package consists of the following modules:

Module 0 Getting Started: starting Maple, the Maple worksheet, new user tour, common mistakes.

Module 1 The Basics: arithmetic operations, brackets, constants and variables.

Module 2 Functions: expressions vs functions, Maple’s functions, substituting in an expression, piecewise defined functions, simplifying an expression.

Module 3 Basic Calculus: limits, differentiation, maxima and minima, integration.

Module 4 Collections of Expressions: Maple sequences, sets and lists, sums and products, manipulating Maple structures.

Module 5 Complex Numbers and Equations: complex numbers, equations, exact and approximate solutions.

Module 6 Plotting: plotting functions of one variable, parametric plots, polar plots, implicit plots, data plots.

Module 7 Linear Algebra: creating and manipulating vectors and matrices, vector and matrix operations, Gaussian elimination.

Remote access to Maple

Maple is available for Windows, Mac and Linux however, these are not free. UNSW provides a cloud based virtual version of Maple that students in first year mathematics courses can access on their laptop. For details see the myAccess website: https://www.myaccess.unsw.edu.au/

Special consideration for the laboratory test

Because the computing tests can be sat at many different times, medical, or other, reasons for missing the test will generally not be accepted. For this reason you are advised to choose an early time to sit the test. If you consider that you have an exceptional reason for missing the test then you must speak to Dr Mak, Lecturer in Charge of First Year Computing as soon as possible after the tests have been completed.

Note that a medical or similar resit may be denied if there is insufficient evidence of preparation for the missed test.

Tutors do not have permission to accept medical certificates for the computing test.

If possible, special arrangements for the computing laboratory test will be made for students with supporting documentation from Disability Services. If you wish to exercise this option, you must contact Dr Mak before the laboratory tests have commenced so that any needed special facilities can be implemented.

Dr Chi Mak (Room: Red Centre 4073)
Lecturer-in-Charge, First Year Computing

Student-owned Computers for Mathematics Courses

The School of Mathematics and Statistics is committed to providing, through its own laboratories, all the computing facilities which students need for courses taught by the School. No student should feel the need to buy their own computer in order to undertake any Mathematics course. Nevertheless, the following information is provided for the benefit of those who may wish to use their own computer for work associated with Mathematics courses.

All of our courses have a UNSW Moodle presence, and it is there you should look for course materials or links unless your lecturer tells you otherwise. UNSW Moodle may be accessed from any computer with internet access; see their help files and pages for technical requirements and how to check whether your web browser is supported.

The School of Mathematics and Statistics provides assistance to students using teaching software in its laboratories. It does not have the resources to advise or assist students in the use of home computers or in communication between home computers and university facilities.

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	α		Nu	ν	
Beta	β		Xi	ξ	
Gamma	γ	Γ	Pi	π	Π
Delta	δ	Δ	Rho	ρ	
Epsilon	ϵ		Sigma	σ	Σ
Zeta	ζ		Tau	τ	
Eta	η		Phi	ϕ or φ	Φ
Theta	θ	Θ	Chi	χ	
Kappa	κ		Psi	ψ	Ψ
Lambda	λ	Λ	Omega	ω	Ω
Mu	μ				