Contents

General information 4

House keeping 4

Administration 5

Course packs 5

Roll Books 5

Class Tests and Marks 6

Consultation 7

Mathematics Drop-in Centre 7

Emergency and First Aid 22
Personal Safety 22

General information

Welcome to the School of Mathematics and Statistics.

Taking tutorials in Mathematics or Statistics is regarded by the School as a very important part of our teaching and we expect a high standard of teaching and a careful and thoughtful presentation of the material.

Tutorials commence in Week 2 and conclude at the end of Week 13. (Lectures conclude at the end of Week 12.)

We expect all tutors to have carefully prepared the tutorial material for each week and be prepared to answer any student questions. You should think carefully about how to present the ideas in a simple but logically correct manner, and to set our your solutions so that they become good models for students to emulate.

Our courses are generally rather solid and contain quite a deal of material. It is therefore important for you to keep up to date and use the tutorial time wisely. This does not require you to do every question in the booklet, but rather to concentrate on key problems and use the time e ciently.

All tutors must be aware that they are not allowed to engage in private tuition in ANY Mathematics subject. This ruling was the result of the 2011 Enterprise Agreement, so if you are unhappy with this you should contact your Union.

Your main contact persons are:

A/Prof. Norman Wildberger RC-4108, 9385 7098, n.wildberger@unsw.edu.au

Jonathan Kress RC-3703, 9385 7055, j.kress@unsw.edu.au

Chi Mak RC-4073, Ph. 9385 7073, email chi.mak@unsw.edu.au

Student Services, Ms. Markie Lugton RC-3072, 9385 7011, m.lugton@unsw.edu.au

OR the course convenor.

Please note that some of the detail which follows is relevant only to those tutoring First Year Mathematics. If you are tutoring a higher year subject, or MATH1041, then you will need to check some of the details with your course convenor.

House keeping

Ms. Markie Lugton will be looking after your contracts and payment forms. She will discuss with you in detail what you need to do.

Pleae make sure that you set up and check your UNSW email address as soon as possible because that is our main means of communication. The School O ce can also arrange Library Access, and access to the photocopy room. Please use the photocopiers sparingly. If you are handing out solutions to class tests, then try to

Class Tests and Marks

In most First Year subjects, there will be class tests held in tutorials or in a special class test class. The dates for the tests are in the course information booklet relevant to the given course.

Students are generally NOT

marks and click \Submit information". If you need to change a mark, you can return to this page at a later time and enter just the changed mark.

Marks should be entered this way as soon as possible as we want students to be able to check their marks online as early as possible so that errors can be corrected sooner rather than later.

Consultation

All full time sta teaching rst year tutorials are asked to give a 1 hour consultation time for each 2 tutorials taken. A roster of those available is displayed various notice boards and the School's website. Students seeking extra help could be directed there. If sessional sta wish to tell their students when and where they are available for extra help they can but are not obliged to.

Mathematics Drop-in Centre

The School of Mathematics and Statistics runs a Mathematics Drop-in Centre for students needing extra assistance. The location is adjacent to the Main O ce on level 3 of the Red Centre and the opening hours are clearly listed there. If you have students who are struggling, they can be referred there. The service is free for all students and is paid for by the School.

Tutorial evaluation

You can opt to have an on-line evaluation form available for your class. See Julie Hebblewhite (RC-3088) before the end of session to arrange for this to happen. Results of this survey will be available only to you via myUNSW. You may, if you wish, show your survey results to your mentor. It is advisable that you do (at least) one per Semester over a twelve month period.

Preparation

Tutorials are paid on the assumption of 3 hours work: 2 hours of preparation, 1 hour delivery. In some cases, marking is also expected of tutors. This is paid separately. As part of the preparation, tutors should be familiar with the notation and approach currently used in the School.

Returning work

On no account should tutors make arrangements between themselves to cover classes. All tutor substitutions must go through Student Services.

Tests and Evacuations

The School's policy on what to do in case an evacuation emergency interrupts a class in which a test is to be sat, or is being sat, is outlined below.

Basic rules:

If a test can go ahead, it will.

All students will be treated equally and fairly as far as possible { those whose tests are disrupted and those whose tests are not. Once started, a test will never be resumed after an evacuation.

Rooms must be evacuated if an alert sounds, and as quickly as possible. Note that in all cases, a student who fails to show (or return) for the test will be marked absent.

What may happen:

The Course Authority will make a decision on exactly what action will be taken if the test is disrupted by an emergency. What the Course Authority decides is up to them, and is not limited to the possibilities suggested below.

If the emergency happens before the test papers are handed out and there is time to t in the test before the end of the class, it will usually go ahead. We allow ve minutes to return to the classroom after the all-clear.

Even if there is not enough time to complete the test, the tutorial or lab will be continued after the all-clear.

If there is not enough time to complete the test, it may be rescheduled to the following class. If rescheduling is not practical for some reason, the Course Authority may decide that the test is to be scrapped, and all students who attended the test will be given an M as if they were absent sick. Marks in other tests will then be scaled up to compensate. Alternatively, if enough time (typically 50%) has passed for an assessment to be made on what has been done, the Course Authority may instruct tutors to mark the work that was done and, to compensate for the lost time, scale up the mark in that test to a maximum of whatever the original maximum mark was. If there are only a few minutes left in the test, then the Course Authority may decide to ignore the interruption and the test will be marked as if the emergency

had not happened.

Computing

In some courses students may have an on-line computing test and/or a laboratory computing test. These may be printed out and, after marking, given to the relevant tutors to distribute. In some statistics courses you the tutor may be asked to mark the lab test. You will be given detailed information regarding this later in the session.

Computer Tutorials

Some of the tutorials in our School (particularly in MATH1041 and in some other Statistics Courses) are held in the computer labs. Computer tutorials are held for a variety of reasons but usually to explore concepts from lectures (like con dence intervals) or for data analysis. Computer classes pose their own particular challenges, compared to a more usual black board and chalk tutorial, but they can be particularly satisfying because most students genuinely engage with the tutorial material and there is an opportunity to talk to each student about their work. In the course surveys for MATH1041, for example, students often cite the computer labs as the best part of the course and comment that they learn a great deal from them.

Most of our computer labs are well equipped with whiteboard, overhead projector, microphone, and the facility to demonstrate using the computer and projection onto the screen at the front of the class. If you do not know how to access the equipment or the account, then ask! Please turn o the projector when you nish your class. Students all have their own computer accounts. Details of how students set their passwords may change from year to year.

> The lab will have been booked for your tutorial. If the class does not ll the room you may allow other students to work at computers in the room if they do so quietly. Ask them to move to the back and ask your class to log on to the computers in the front of the room.
>
> I do not allow other students to work in the lab during computer tests, and in this case there is a \sandwich board" to put up advising other students to go elsewhere. Please put the \sandwich board" away when your class nishes!
>
> As with any tutorial, be well prepared beforehand. Work through the exercises yourself.

You may have particular instructions from the course convenor, in which case follow them!

Do not just sit at the front in case someone wishes to ask you a question. Be active! Sometimes, particularly at the start of session, it seems natural to demonstrate something first to start the class, but otherwise I usually let the students get started on their own, encouraging them to help each other. I walk around the class having a word with every student to establish how things are going in the course and in this tutorial. If many people are having trouble with the same thing I go back to the front and give a short demonstration, but otherwise I keep on round the room engaging with each student or group of students. I find I usually get round the whole class twice in the hour. If a student has nothing to ask me or to comment then I might look at their

7. Encourage and provide opportunities for students to suggest di erent ways of tackling problems
8. Show students some related sideline which is relevent and interesting

had some excellent questions asked by students that have been a springboard for elucidating lots of ideas. The important thing is however that you give positive feedback to students asking questions \That is a really interesting question, thanks for that...", or \I was hoping someone would ask that...". You should carefully listen to the student's question. I have visited tutorials where a student has asked a very pertinent question and either been ignored or misunderstood by the tutor. Needless to say, the student asked no more questions during the tutorial. One must also be patient with the students, as, if you are really encouraging them to ask questions, then you are bound to get a number of silly questions, perhaps even asking what you thought you had just explained. Never put a student down for asking a stupid question or they will never ask another question again.

3. Go through solutions to problems based on the lecture material

This is the main purpose of the tutorial. In most rst year subjects you are given a fair degree of advice as to which problems to do (but keep in mind that you should also attempt to answer any student questions as well). You should make sure you are using the same notation as the lecturer to avoid confusing the students. Solutions should be mathematically correct (without being pedantic) and clearly set out. Rememb ep3 Te
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tion. You are there to `shed light', not show o . I visited a tutorial once where the tutor took 20 minutes to nd the range of f (x) = $\sqrt{9 - x^2}$ for a rst year class. His method was to prove that the range was a subset of the interval (1 ; 3] and also a subset of the interval [0; 1). No diagram was drawn!, just boardfulls of abstruse inequalities.

Needless to say, you should always use diagrams and diagrammatic aids in teaching. As well as clarifying ideas they also help students to learn and remember.

You should also feel free to alter slightly the tutorial problems if you think it will help the student's understanding. For example, in MATH1131 Algebra one is asked to nd a formula for sin 7 and cos 7 . I would probably do sin 6 and cos 6 or sin 5 and cos 5 since nothing is gained by doing the more complicated problem, and in fact it just wastes time.

4. Clarify ideas and sort out any problems of understanding which students may have

This aspect is intimately related to the above. It includes making sure that the students correctly remember (and correctly learnt!) mathematics from school. Students may ask you about some aspect or problem covered in lectures, which may or may not be important. I often nd that students in MATH1081 come into the -25.384 -392(ias8d60

5. Relate current material to earlier material or concepts

The wonderful thing about mathematics is the incredible interplay between the ideas and we should be constantly stressing this in tutorials. Students learn best when new ideas are related back to ones they are already familiar with, whether from school or earlier in the course. Much of the algebra course in first year in second session consists in giving new interpretations to row reducing matrices which they learnt in first session. The *ML* theorem in Complex Analysis is simply a generalisation of the geometrically obvious fact in the real plane that $\int_a^b f(x)\,dx \leq (b-a)\max_{x\in[a,b]}|f(x)|$. Relating the direction vector of a line in 2-dimensions to the gradient of the line is another example. Students often do NOT make connections between ideas and often do not see how the new ideas relate to what they already know. Some (far too many in fact) try to learn mathematics by memorising methods without much understanding of what is really going on. We can discourage this by emphasising and pointing out for them the important ideas and how they connect.

In other words, tutorials should not just be `problem solving classes' where the tutor just presents a solution.

You will probably make the point that all this should be done in lectures. That is true, but lectures have to cover a lot of material (so of course do tutorials) but even

that is being looked at. You don't have to go into great detail, but students will be more highly motivated if they can see that further down the track all this maths is going to have some very important point. Maths should not be presented as a series of meaningless methods and examples which have to be learnt to pass the exam. It is not hard to give glimpses of the `big picture' along the way and give some point to the occassionally dull piece of work in hand. I often try to whet the students' appetite by mentioning (brie y) how the current material will be used later to answer some bigger problem.

7. Encourage and provide opportunities for students to suggest ways of tackling problems

The tutorial should not be a monologue given by the tutor. Neither should it be like a sociology tutorial where students spend most of the time giving their (limited) opinions. The maths tutorial should be interactive, with the tutor leading, guiding and initiating discussion and asking lots of directed questions to the students.

Students do from time to time come up with novel and sometimes very interesting ways to do problems. This should be encouraged. I have visited tutorials where a student volunteered an excellent way of tackling a problem, but the tutor either completely ignored what was said or told the student that they had to do it the tutor's way. This was very poor teaching and very poor mathematics. If the student volunteers a `bad method', i.e. one that will lead us up the garden path or will not apply to other similar problems, then we ought (in most cases) to show them the consequences of their suggestion rather than just dismissing them out of hand.

Whenever a student volunteers an answer or suggestion we should always make the student feel good about doing so. Negative feedback or completely ignoring a student response is not going to encourage students to respond.

8. Show students some related sideline which is relevent and interesting

This should not be done very often, especially in rst year classes, but there are de nitely times when it should be.

When doing problems on recursion in MATH1081, I always take in my *Towers of Hanoi* game which takes no more than 5 minutes to explain but which is very helpful in understanding recursion and certainly captures student interest. A simpler example might be to take in some MAPLE printouts of curve sketching for example, or using a MAPLE printout to show how the Fourier Series in a given tutorial exercise actually approximates the function. Such things should be interesting and instructive without being time consuming. I do occasionally (time permitting) wander o the track a bit to show students some related and interesting idea which may not be directly in the syllabus. This can be very useful with a very good class.

Troubleshooting

The points and comments made in the earlier sections are all idealised and work well in a *perfect world*. Unfortunately, the real world is not always as rosy.

We are going to have to deal with the day to day problems of teaching and in this section I want to give a few ideas and tips on how to cope (as best we can) with the reality of teaching students in large theatres or classes, some of whom do not speak English very well, are shy and reserved, overwhelmed by their workload, or perhaps (in very few cases) sarcastically unpleasant or immature.

If problems do occur, it is very important that you do not let them get out of hand. Talk to your assigned mentor if you are a new tutor, otherwise you can always speak (con dentially) to Peter Brown or some other member of sta . Problems that are not properly dealt with do not go away.

Being Personable

On the whole our students are very polite and friendly individuals. They respond well when they feel that they are being treated as adults and if their lecturers and tutors appear to respect them and are genuinely concerned for their intellectual welfare. They do not respond well if they are made to feel very stupid or inferior, or if they feel that their teachers regard them as nuisances who interfere with their research time.

At the beginning of every session I ask (and write) in my roll book each student's rst name, and try to use this when I call the roll. I recall a student once commented that I was the rst tutor she had had who did this, which I found rather disappointing. It is a simple way

Clashes With Students

Situations do arise from time to time where there is a clash between a student and a lecturer. This may occur over a range of things. They may not like the way a test or assignment has been marked and wish to argue with you over it. The students may talk in class, throw paper aeroplanes in lectures or be otherwise objectionable. You may believe they have cheated in a test or (more commonly) have copied in an assignment.

Altercations between lecturers and students are fairly rare but you should be prepared for them and have thought out carefully how to deal with them.

Firstly, it is important that you state clearly (in writing if appropriate) exactly what you expect from the class. I try to do this in a positive way. For example, in lectures I suggest to them that they should aim to take in about 80% of the material in the lecture and that this will save them a lot of time. Hence, of course, they will need to listen carefully and quietly to the lecture.

The same logic goes for behaviour in class. I generally (especially in large first year classes) make it clear in the first lecture exactly what kinds of behaviour I expect from the students. I point out to them that I will carefully prepare my lectures to make them as interesting and understandable as I can and I will also do my best to make

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a verbal presentation then I have to have their complete attention.

I say all this calmly, but rmly and make sure they are all listening to me. Paper

be aware of.

Involving students in the lesson

You go into class determined to involve students and give an interesting and dynamic tutorial (or lecture). You ask the first questions and the silence is deafening. You answer your own question and try again. After about four attempts you decide to give up and give a monologue. This is a typical scenario, especially when you first start teaching. How can you get a response from students? We have a fairly large proportion of students who come from cultures where active verbal participation in class is not the usual practice.

Here are some suggestions to think about. Firstly, you must be careful as to the type of question you ask, especially when you are first starting off with a new class. They don't know that you are about to give an interesting and dynamic tutorial, if only they would participate. You have to get them into a participatory role and this takes time. (Remember Pavlov's dogs!) Asking `Now what is our first step in solving this problem?' is probably not the best question to begin with. Keep your

for all.

Through the Student Services O ce, we coordinate special provisions for Disability Support Services (DSS) students.The liaison person for DSS students in the School is Markie Lugton, Student Administration O cer (RC-3072, ph: 9385 7011).

We believe that Lesbian, Gay, Bisexual and Transgender students ought to be able to enjoy their time with us without experiencing any sense of alienation or ill-treatment at the hands of either sta or fellow students in the University. The School liaison person for LGBTQI students or sta is Peter Brown, (RC-5106, ph: 9385 7106), while Catherine Greenhill (RC-5015, ph: 9385 7105) and Julie Hebblewhite (Student Services Manager, RC-3088, ph: 9385 7053) are members of the Ally@UNSW network.

Teaching surveys

UNSW has an online system for course and teaching surveys called myExperience.
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for regular updates to school WH&S policy and procedures.

Emergency and First Aid

Sta are reminded that in the case of an emergency, they should call security on 9385 6666 or 1800 626 003 who will arrange help and emergency services as required. If there is not an emergency, security can be contacted concerning routine matters on x56000. In the case of an emergency, the School of Mathematics and Statistics has designated Floor Wardens to ensure an orderly evacuation of the building. Sta are reminded that in the event of an emergency they should follow all the instructions that they are given and ensure that any students etc. are evacuated in an orderly manner. After exiting the building, all people who were in the building should follow the instructions from the warden and move away to the designated assembly area.

The School of Mathematics and Statistics has a number of sta with First Aid quali cations. There are updated lists near the stairwells in the Red Centre.

Personal Safety

The School is also concerned about the personal safety of sta and students. You can help in this by doing the following:

If you see someone you do not recognise in a non-public area of the building, ask them who they are and if they need any help.

If the glass doors in the centre wing are open after 6pm or on weekends, close them.

If an outside door has been held open after 6pm or on weekends, close it.

If you are working after 6pm and you would like an escort to your car or the bus stop, you can call security on 9385 6666 to ask for a cycle escort.