

## **Advice from mature students on how to succeed in 1<sup>st</sup> year mathematics at NUIM.**

Last year (September 2012) I (Chris) started the BSc in Science in NUIM. It was nearly 10 years since I had last been at school and I worked in construction during that time. I didn't remember any of the things I had learned from my time at school and I had to start basically from scratch learning college mathematics. I was nervous about how little I knew, and how much everyone else seemed to already know, or had done before starting! There was no need to worry. Whether you know a little bit, or nothing at all, if you find your own routine for studying and keeping your notes and materials together, you will be fine. Hundreds of students are in your position every year, and they get through it. You can too.

First year maths at college is about finding a strategy that works best for you. Everybody's approach to maths is different. There is no right way that works for everyone. It may take a week, a month or even a semester to find a study routine that fits. It's a process of trying one approach for a week or two, thinking about whether it worked, stressed you out, took too much time and importantly helped you understand the material and got your assignments done. You then decide whether to keep using that routine, keep doing some of the things you were doing or you might try something completely new.

There will be times when you find maths difficult. When you first encounter things in your lectures and problem sets it can be discouraging when you make mistakes. The mistakes are an important part! They help you identify things that you need to work on. One of the main things that will help you to do well in maths is reacting to mistakes in the right way. You will have your lecturers, a tutor, Maths Support Centre, online videos and resources, and your classmates and friends to help you find a way of understanding topics that works for you. In maths things that seem difficult at first tend to get easier as time goes on something that seems difficult now may be much easier, in a few weeks.

If you have been out of education for a long time this can be an advantage. You will have a chance to start fresh and learn the maths that you need for your degree. A college course is self-contained, it starts from scratch on all material and will go back over maths you learned outside college. This is important to note. If you seek help when you get stuck and work all the way through the semester, at some point all the material will start to fit together. This happens at different times for different people. The experiences that mature students bring to college can be a huge asset in a college course. The discipline gained from working can be applied to college work. College, roughly speaking, is like a job. There are deadlines, easy and difficult parts, things you don't want to do and things you enjoy and a constant learning curve.

Getting settled into college can take time. The pace can feel very quick the first couple of weeks and there is always something that needs to be handed in around the corner. When you can't figure out something try it again the next day. Don't spend excessive time staring at a question that could be put to better use somewhere else. On many occasions a problem that was impossible the previous day, after a break, can be solved easily.

On the following pages you will find advice from some of last year's first year mature students, some dos and don'ts of first year maths and a list of resources that can be useful as a starting point for

further explanations and reading related to your maths modules. The most important thing to know when starting is that there is always maths help available at NUIM if you get stuck or don't know what to do.

-----

The following are a list of dos and don'ts for the maths course based on my experiences in first year. It is not an exhaustive list and its purpose is to highlight some things that are helpful to know before starting first year maths.

#### Lectures:

**Do:** Attend all of your lectures. The lectures are where you get the most important part of your maths course which are your notes. Your lecturer will give you your first explanation of each topic here and work through lots of examples, explain definitions etc. Writing out your notes also helps you get familiar with the topic being covered. If you miss your lectures through illness it's important to find out what was covered and get the notes you don't have off a fellow student.

**Don't:** Get discouraged if you don't understand the material that is being discussed in a lecture, this is extremely common! No one will understand everything that is said in a lecture. What's important is that you do something about the things you don't understand. Try some examples from your notes, go to the maths support centre, ask your lecturer/tutor, ask other students or watch a video online.

#### Tutorials:

**Do:** Ask your tutor questions. It can be a nervous experience to ask a question if you are worried you are going to be wrong. But honestly half the people there probably are wondering about the same thing. If you are nervous just ask after the tutorial. Listen out for the questions the tutors ask the class in the tutorial. These questions are really important as they emphasise the techniques you need to use to start a question or overcome the awkward step that stops you from completing a question. They also help point out common problems students are having with the material.

**Don't:** Forget to take down what is written on the board. It's important you take down everything you can. The problems and graphs that are written on the board will be there for 10 minutes. If you take them down you will have them as examples for the entire semester.

#### Notes:

**Do:** Make sure you have a complete set of notes. I cannot emphasise enough how important this is. You should take down all your notes in a notepad that is exclusively for maths (There will be a lot of notes). Each time you take down notes you should write the date and the Module code or Module name at the top of each page. This makes organising your notes much easier.

When writing notes or attempting problems skip a line between each line of maths that you write. This makes it easier for you to read your own notes and it also makes it easier for someone else to follow your steps in assignments and exams.

Don't: Work on examples in the same copy that you write your notes in. It will be harder to find a specific page in your lecture notes that you need if you have similar examples done in your notes copy.

#### Maths Support Centre (MSC):

Do: Use this resource. NUIM has free maths help for students 20+ hours a week. You should attempt problems using the related section of your notes before you go to the MSC. Try to put in words or make a note of what it is you don't understand and bring your notes and attempted solution. You can ask questions on any mathematical aspect of your courses.

Realize that there is more to the MSC than just the drop in centre. There are also handouts on basically everything that you will cover this year that you can take away. The MSC runs two workshops each week and a maths proficiency course that are really helpful no matter what level you are at. The MSC website also has links to handouts and videos that you can use to help improve your understanding.

Bring your notes to the maths support centre. They emphasise this throughout the year and there is a good reason for it. If you don't have your notes with you then it is much harder for you to make the most of your time there. Especially when reflecting on what you have been told by a tutor, using your notes as an aid is invaluable.

Don't: Use the maths support centre just for assistance on your homework. This is not how it is supposed to work. If you don't do independent work to understand the maths being covered in your courses you will only make things harder for yourself. During the term you will be able to ask questions at the MSC to help complete your understanding of material on assignments but ultimately in the exam you are on your own.

#### Problem Sets:

Do: Attempt all the problems that you have to hand up. It's normal not to understand how to do some or even all of the questions the first time you look at them. The process of going to your notes and trying different ways of solving each question is how you learn. Starting the problem sets early in the week is a very good approach. It's easier to get help then and you have more time to work on the problems. Sometimes when you get stuck it can also be helpful to try an easier version of the problem get the answer and build up to the question on the assignment.

Don't: Get frustrated when many of the problems on the assignment seem difficult. Everyone feels that way from time to time. It is important that when things are difficult you do things that will help you understand the difficult parts. Don't rely completely on a group. Recognise that group work when doing assignments can be positive or negative. You can get ideas from others in a group and discuss problems, but remember you will sit the exam on your own at the end of the semester and that's important to keep in mind. Making your own mistakes shows what you need to work on.

#### Resources:

Do: Try different resources. It's easy to find one resource and forget that there are alternatives. Use handouts, videos, tutors and office hours when you are stuck. What you spend an hour on using one resource may be explained in 5 minutes using another

Don't: Forget that your lecture notes are your fundamental resource. Other materials may be less difficult or more difficult than what's being covered on the course. Exam papers are an indication of the level of material covered in the exam. But they change from year to year.

-----

Feedback from more mature students on maths in first year.

Alan (First Studies) – I went to work in Holland in 1990 and returned to work in Ireland in 1998 working as a warehouse manager. Since then I worked as a fitter and in maintenance on the Luas construction project and most recently as a taxi driver. I now have a family and getting a job that is rewarding and pays our bills is my main reason for returning to college. I feel I was not prepared when I returned to college, but this year helped me adjust. I found that at college there is a lot of work left to the student to do and that you need to be motivated in order to succeed. I got involved with the Maths support centre and the maths workshop. I also found the Khan Academy videos were helpful. My advice to a new student is to take maths one week at a time. I found the first semester very tough, but when I found my feet and got to know what I needed to do and how to get the most out of the supports available, I enjoyed my first year. I feel ready for second year maths.

John (First Science) – After finishing my leaving cert I attended DIT for a year until I decided the course there was not for me and I wanted to try something different. I worked in small retail based jobs for a couple of months each before starting an apprenticeship in carpentry. I worked as a carpenter for four years. There was very little work available and I had a desire to return to college to further myself and my job opportunities. I enjoy maths and although I was not very intimidated by it starting off, getting through first year certainly has made me more confident I can handle it. I used the Maths support centre and Patrick JMT throughout the year to help my understanding. My advice on getting through first year is to give an honest representation of your work when handing in your assignments, work through them throughout the entire week and watch the related videos on Patrick JMT. The assignments can be hard, but the exams at the end are not as difficult.

Catherine (First Studies) – Following my leaving certificate I worked in retail management for 10 years and I always felt a desire to return to third level education. I was anxious about choosing maths as one of my subjects. Even though I spoke to members of the mathematics department, I still felt I was entering into the unknown when I started. In the beginning I struggled as I was both learning new maths and re-learning the basics, but by the end I was delighted in how far I had come. I found maths more difficult than previous experiences at school but there were great supports available like the maths support centre, PatrickJMT (website) and mathtutor (website). I have learned this year that there are many ways to attempt a question and that you learn a lot through making mistakes along the way. I would advise any student starting maths to use the maths support centre and talk to the staff in the maths department if you get into difficulty. There is a lot of new material covered throughout the year and if you put work into the weekly assignments then you can focus on revising at exam time.

Peter (First Science) – After I completed my leaving certificate I worked in a few menial labour jobs before starting my own technology based business in 2009. I wanted to return to college to learn computer programming as it was a major part of my business. During secondary school I disliked maths and I'm no grade A student, but after first year I feel I am equipped to learn any maths I need to complete my degree. Some of the content of the maths course were difficult to me and I felt I was behind a lot until I undertook my own study routine using [www.mathcentre.ac.uk](http://www.mathcentre.ac.uk). The advice I would give an incoming student is to use online resources to fill in the gaps in your knowledge when you study. Finishing every assignment is also important. If you keep on top of your modules using online resources like PatrickJMT and Mathcenter.ac.uk you will be fine.

-----

### Conclusion

There are many different ways to successfully complete first year maths. There is lots of help available no matter what level of maths you had before you came to NUIM. Every year students outperform their expectations in the first year maths course after starting with doubts about their ability. The course can appear difficult at times, but it's difficult for everyone. Give yourself the best chance to succeed by attending your lectures and keeping your notes together. Use the workshops, office hours, the five minutes after class and the online resources. Everyone has to start somewhere, your lecturers and tutors have heard all the questions before and are happy to answer any questions students have. Study with friends and alone, go to the maths support centre regularly and if something doesn't make sense try a new book or ask someone new. Persistence is important. If you focus on finding ways to do each assignment and learn from your mistakes, by the end of each module you will be surprised how far you have come. The first year course is do-able and if you work at it you will pass. You might even grow to like maths and keep it on! A large number of students do.

Resources:

Online Resources:

- <http://supportcentre.maths.nuim.ie/resources> - A full list of good quality maths resources available online.
- [www.patrickjmt.com](http://www.patrickjmt.com) – short maths video tutorials. (Useful for Calculus)
- [www.khanacademy.org](http://www.khanacademy.org) – maths and science video tutorials. (Useful for Calculus, Linear algebra and Statistics)
- <http://www.mathcentre.ac.uk/> – Online videos, printable handouts and sample questions.

Paper Resources:

- Maths support centre – contains handouts free to take away on nearly everything covered in first year. On the wall there is a list of all the handouts with the number needed to find them.
- Library – Course books for all your mathematics modules can be found on the 2<sup>nd</sup> floor of the old library in the 500 section.
  - Calculus – *Essential Calculus: Early Transcendental Functions* – Larson, Ron (515 LAR)
  - Linear Algebra – *Linear Algebra* – Anton (512.5 ANT)
  - Statistics – *Stats : Data and models* – De Veaux (519.5 DEV)

There are many other books also that include the same information and are kept in the same area as these books.

Extra Classes:

- Maths Proficiency Course (eMPC): The eMPC is an extra online course which covers fundamental maths techniques that are needed to attempt more difficult course material.
- First Science Maths and First Maths Studies Workshops: The workshops run every week and cover material which students have been struggling with.

Students are encouraged to email the workshop tutors ahead of each class with material they would like to be covered. The material covered in these classes is also posted online.

**This document was created by a mature student (Chris), with input from four other mature students, and has been approved by members of the Department of Mathematics & Statistics.**