

Queen Mary Mathematical Sciences degree: your career, your future!





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Introduction

This booklet will give you an insight to the wide range of job possibilities that are open to you when you graduate with a mathematical sciences degree from Queen Mary. Featured within it are real-life stories of people who were once in your position, to help you think about where you want to go next, what opportunities are available to you and more importantly what you need to do to get there!

One thing to remember is that the job market is much more flexible nowadays. People often have more than one career, so you don't necessarily have to decide what job you want to do for your whole working life. Instead, you can decide what you'd like as your first step, on what could be a journey with a number of unexpected opportunities to develop your career in different directions.

As you read through the booklet you will notice that a lot of the individuals were involved in extra-curricular activities at Queen Mary. Trying out new things through activities outside of your degree can help you to evaluate what you are good at and what you enjoy doing and this is a good starting point for thinking about what job you would like to do after graduation.

Extra-curricular activities also helped people to secure work experience or a job upon graduation, as employers are looking for students who take the initiative to undertake activities outside of their course. Put yourself in the best position for getting a job doing the same: the students' union (www.qmsu.org) offers lots of societies you can actively participate in and there are many other opportunities to develop new abilities through on-campus paid and unpaid roles such as student ambassador, peer mentor or Provide Volunteer.

For assistance in finding work experience, on-campus working opportunities, internships, part-time work and full-time work or further study after university visit Queen Mary Careers, Queens' WG3 (www.careers.qmul.ac.uk). Careers also runs employer-led events and careers fairs where you can find out more about working in certain areas and for particular companies and provides support on all parts of the application process through one-to-one guidance with a careers adviser.



Whilst at university



Name: Jabeen Akhtar

Undergraduate Programme:
BSc Mathematics
at Queen Mary

Graduate in: 2012

Tell me more about the internship that you are doing at the moment?

I am currently in my second year and also spend time on an internship within financial management at the Human Rights and Social Justice (HRSJ). This involves working half a day a week, during term-time, over a six months period. However most internships take place over the summer holidays.

What have you enjoyed from your time there?

I had not worked in accountancy before but I am really enjoying my time here. I relish the opportunity of working in a field where precision and accuracy are of paramount importance. Since this is a financial management role within a small department you really get exposed to many different types of roles, for example, that of the Events Manager. It is interesting to see how my skills are different to those required for an Events Manager.

What else have you learnt?

In small organisations you are exposed to all the different areas of the organisation, whereas within a large organisation you may only work within one specific department, such as the Finance or Accounts department. I took this job, as I have done with similar roles, to get a feel of as many different types of jobs that there are. This is definitely something that I can put on my CV and will make me stand out from the crowd when I go for a graduate role!

Do you use any of your maths degree in this role?

I just use basic numeracy; however, the skills that my course has taught me such as logical thinking have helped.

How did you get this role?

It was not easy! I spent a large part of last summer researching on the internet all the available internships opportunities that were out there. I changed my CV into one which is tailored towards Finance and I made the most of the financial aspects of my degree. My advice would be that you have to keep going and keep being pro-active despite the knock-backs and that you

Get the facts: Internships



will get there in the end. I submitted around 20 applications before I was successful; if you keep learning where you went wrong and keep persevering then you will succeed.

Are there other things that you have done?

I have volunteered for the Aim Higher Scheme in which I motivate young people and am a STEM Ambassador. I believe that actually experiencing these kinds of roles is the best way to learn about them and even though you do not get paid it helps you make an informed choice as to the kind of career that you want to go into. My advice is to be pro-active, say yes to everything and experience all the great things that you can do with your maths degree!



'Internship' is a term used to describe a placement in an organisation, in which you are given direct responsibility for work tasks and gain experience within that role. Internships often take place over holiday periods and usually run in the summer for 4-12 weeks.

Application deadlines for internships vary, from November to late Spring. When looking for an internship you need to first decide what area of work you would like to intern in and then search in those areas. Internships listings are available from Queen Mary Careers centre.

Formalised internships are not the only way to get experience. You can organise your own work shadowing or work experience with a company in an area of interest to you.



Whilst at university



Name: Abira Iqbal

Current Programme:
MSc in Statistics at
University College London

Undergraduate Programme:
BSc Mathematics, Statistics
and Financial Economics at
Queen Mary

Graduated: 2010

How has your course at Queen Mary helped you?

My degree at Queen Mary was an important factor in giving me the grounding to go on to study a masters programme. At Queen Mary I studied in-depth statistical modules, such as time series, statistical modelling and theory. I therefore have an advantage over the others on my course who came from different degree disciplines.

Were there other things that you learnt?

Not only did I study a subject I thoroughly enjoyed but I was also able to improve my organisational skills and am now a lot more persistent. The weekly assignments I had to complete were important since it taught me to work to strict deadlines as well as develop my understanding through practical applications that were set within the coursework questions. Studying mathematical sciences has enhanced my ability to think and approach problems with a logical mindset.

What career advice would you give to current and prospective students?

I have been searching for a job for the coming year and I do believe that a maths degree is something that employers value highly. I believe at university one needs to be very proactive in developing skills that are beyond the normal confines of their subject discipline. This I did by active participation as a student ambassador and a PASS mentor. I would also stress the importance of trying to make good links with someone in a career area you wish to go into. This could be by an internship either with a large firm or even a small local business. The more experience you have the greater your commercial



awareness will be and little things like that could be the difference with employers after you have graduated.

In addition to your studies have you managed to get work anywhere?

I managed to get an unpaid placement with the Financial Times after my degree after looking for such roles for ten months. I therefore wish I would have started to look much earlier and would advise other students to start looking from your first year at university.

Get the facts: Accountant

Many accountancy practices provide internships over the summer break for second years and insight weeks over the Spring break for first years. As an accountant you could be advising other companies, auditing their accounts, giving tax advice or setting budgets and managing financial systems, depending on your exact role. To become a Chartered Accountant you need to undertake a series of professional examinations and these are often paid for by your employer. In addition to your academic qualifications you are expected to display certain qualities including initiative, self-motivation and team-working.

For more about the role of an accountant see:
www.fssc.org.uk/directions - and search for 'high street' for detailed profiles.

For details about qualifications:
www.accaglobal.com
www.icaew.co.uk
www.cipfa.org.uk
www.cimaglobal.com

Typical starting salary: £19,000 - £25,000.
On qualification, since you will have a greater capacity to generate revenue for the company your salary will increase significantly.

For assistance with your application visit Queen Mary Careers, Queens' WG3.



Whilst at university



Name: Andy Drizen

Current Programme:
PhD in combinatorics
at Queen Mary

Undergraduate Programme:
MSci Mathematics
at Queen Mary

Graduated in 2008

How does doing a PhD compare to undergraduate studies?

The first thing to mention about doing a PhD is that you will know more about your research than nearly all seven billion people on the planet; you are a world expert. You will discover things that nobody in the whole of human history has ever known before. Doing a PhD is quite a bit harder than an undergraduate programme. You have to be self-disciplined in your study and there are long periods of time where you think you've made very little progress or even negative progress, as it can take time for the solution of a problem to fully develop. You feel like a problem is too hard to solve, however once you solve it and look back at your conquest, you think of it as trivial and wonder how you ever struggled with it in the first place. However like a magic trick it is only impressive until you know how it is done. A huge benefit about coming to Queen Mary to research mathematics is the sheer number of other postgraduates around that you can talk to about the challenges you encounter in your PhD.

What is the life of a PhD student like?

The lifestyle of a PhD student is fantastic. You are paid to do something that you enjoy – not every job can offer you this. On top of that, you are surrounded by interesting, like-minded and relaxed people in a relatively non-stressful atmosphere. Your duties include meeting with your supervisor on a regular basis and, if you like, going to seminars where professors and students alike tell each other about their current research interests. Most seminars are usually followed by a visit to the local pub; it's a great way to get to know your new colleagues.

Get the facts: Computer Games Designer

There are many areas from a mathematical sciences degree programme that can be applied directly to a job in computer design. This includes using fractals to design trees and plants and hence reducing the time in not having to program each individual tree and plant as well as designing objects that move and rotate through space - for example a football in front of a stationary background.

Often you would start off as a designer and from there progress to Lead Designer and be responsible for the overall vision of the game. There are other roles including: Script Writer; Storyboard Artist; Illustrator and Graphic Designer as well as being a Games Tester, all within an industry worth £2 billion in the UK alone.

**Further information is at Skillset :
www.skillset.org/games/careers**

Typical starting salary: £19,000 - £25,000

Get the facts: PhD

The School of Mathematical Sciences at Queen Mary offers flexible MSc programmes in all areas of mathematics, statistics, astronomy and astrophysics. In addition the School offers Research Degrees in all of these areas leading to the degrees of PhD and MPhil. Queen Mary has one of the largest mathematics departments in the UK and has dedicated office space and computer facilities for postgraduate students. Candidates should normally have the equivalent of a British first or good upper second-class honours degree in mathematics or statistics.

**For more details including further information on how to apply:
www.qmul.ac.uk/postgraduate**

Are there other perks?

Travel is the other major perk of the job. I've seen and given talks in many countries, even as far afield as New Zealand. The mathematics department is always supportive of any time you need to take in order to travel elsewhere to meet other mathematicians who can further your research.

Do you know what job you would like to do after your PhD?

In terms of my future career: I haven't decided yet. There are many possibilities beside the obvious academic route, for example, programming computer games, for which my Linear Algebra knowledge would be vital. Or possibly I might like to work at the Government Communication Headquarters (GCHQ) – one of the largest employers of mathematicians in the country - where I can be once again surrounded by many other like minded people.



First graduate job



Name: Fahmida Khanom

Current role: Analyst responsible for Institutional Reporting

Undergraduate Programme: BSc Mathematics with Business Management

Graduated: 2009

What was your experience of securing a full-time job?

Before I graduated I was finding it hard to get interviews for graduate jobs and those I did get a response for were for lower grade jobs. I did not know where I was going wrong.

The Adab Trust provided an extensive course which ran for 3 months from July until September and involved mock interviews and exams. The feedback was good as they gave advice on what areas to improve on but the main thing that was of value was the confidence that it provided. Telling me where my strengths were was a real boost! The assistance that I received was invaluable when I made it on to the interview process at JP Morgan in the City in March 2010.

What was the process like?

On the whole it was demanding and long and I had six interviews and I can honestly say that if it wasn't for this programme then I would not have got through the interviews. The main advantage was that I knew what to expect and was not as nervous as I would have previously been. I now work in institutional reporting in the firm's asset management division.

The programme I was on offers a foot up the ladder to talented black and Asian graduates helping them make inroads into the tough graduate market.

Get the facts: Organisations dedicated to increasing graduate employment for under- represented minorities.

Adab Trust

The Adab Trust works with a host of employers in a number of business sectors who are committed to addressing diversity, equality and inclusion and tackle the issue of under-representation of ethnic minorities. Partner employers include Barclays Bank and Ernst and Young.

Further details: <http://adab-trust.org/>

Sponsors for Educational Opportunity (SEO) London

(SEO) London every year provides first to third year undergraduate students from under-represented ethnic minority backgrounds the unique opportunity to gain summer internships at the most prestigious investment banks, professional service firms and corporate law firms in the UK. 80% of the SEO interns go on to secure full-time graduate positions at their partner firms. Further details:

www.seo-london.com/

Windsor Fellowship

Windsor Fellowship support black, Asian and minority ethnic undergraduates and graduates, particularly in their transition from higher education into immensely competitive professions and fields of graduate employment. Partner organisations include Goldman Sachs, Tesco and the Teacher Training Agency.

Further details: www.windsor-fellowship.org

Reach

Reach is an online community designed for University of London students who feel they face barriers such as social background, disability, age, gender and sexual orientation to reaching their potential.

Further details:

<http://reach.thecareersgroup.co.uk>



First graduate job



Name: David White

Current role: Biostatistician

Undergraduate Programme:
Mathematics and Statistics
at the University of Surrey

Graduated: 2007

How did you become a Biostatistician?

I was not sure what I wanted to do after my degree and after speaking with a careers advisor decided to apply to take a year out after my second year and apply to work as a Trainee Biostatistician at Quintiles, a leading Contract Research Organisation (CRO). This taste of the employment world gave me renewed vigor for when I went back to finish my degree.

What happened next?

I took an MSc in Statistics with applications in medicine and progressed to enjoying working as a fully qualified Biostatistician at INC Research. I now act as a Lead Biostatistician on a number of studies over a range of therapeutic areas and work with a number of different people including project managers, drug safety, data managers, programmers and scientists.

What challenges do you come up against?

One of the biggest challenges is when you are working with clients who have read about certain statistical techniques which they want applied to their trial. A key here is being able to explain complicated statistical terms in a simple way – not everyone knows what a p-value is! In addition



you always have your fingers crossed when you click a button to see your programs run and hope that you get positive results. A successful trial rarely happens but when it does it is cause for celebration.

Is there room for development?

As a member of PSI (Statisticians in the Pharmaceutical Industry) I get to network with fellow statisticians and attend courses. One such course shows exactly what statisticians do in various phases of clinical trials from pre-clinical through to final phases in human drug trials. In this industry it is possible to work in any of these areas all of which have an overall common aim of finding a cure to diseases.

Get the facts: Medical Statistics

A pharmaceutical company works to discover new medicines and to improve existing ones and statisticians are used at all stages of drug trials. There is always a need to know that a disease or condition has definitely been improved by the medicine, therapeutic or medical device that you are testing and not by any other means. Statistics proved to be key, for example, in establishing a link between smoking and lung cancer. As David has done here, to work in medical research you would usually have to undertake an MSc in Statistics. There are then various options open to you including working for a Contract Research Organisation (CRO) as well as working with a research group in a university, such as the specialists in biostatistics in the Institute of Health Sciences, Queen Mary.

For more see:

www.psiweb.org

– Statisticians in the Pharmaceutical Industry

www.rss.org.uk

– Royal Statistical Society

www.ihse.qmul.ac.uk

– Institute of Health Sciences

Typical salary for a Statistical Programme, for which a BSc in mathematics, statistics or computing is required, would be £18,000 - £22,000. An MSc graduate would usually join as a Statistician and would start on £20,000 - £25,000



First graduate job



Name: Caroline Donaldson

Current role:
Financial Analyst

Undergraduate Programme :
BSc Mathematics and
Statistics at Queen Mary

Graduated: 2006

What was your experience of securing a full-time job?

As soon as I graduated I decided to look for a job in investment banking so I wrote to and emailed about 40 banks in the City. I was lucky and from the very few replies, the last bank on my list offered me an interview and consequently a job with them. The interview process was long, involving 3 interviews, with additional people

sitting in with the panel on each occasion. It was with a Japanese Investment Bank based in the City. I started soon afterwards and went to work in the middle office as an Officer.

How have you used your degree in this role?

The statistical part of my degree has definitely helped me when various requests have been made for reporting reasons and analysing data, although my main role is within trade life cycle which involves handling all Asian equities from inception to settlement. The role involves a mixture of trade support and settlement and helping support new business and project work.



Get the facts: Investment Banking

Gaining relevant financial work experience is an excellent way of increasing your chances of employment as a graduate in this area. Almost all of the large banks offer summer internships for students in their penultimate year. Applications are generally due the previous autumn. Additionally more banks are offering 'insight weeks' during the Easter holidays for students in their first year. For full details, visit the website of each bank.

There are many different areas within the banks, the main ones are Front Office, Middle Office, Operations, Compliance, Finance, Legal, Internal Audit, Treasury, Credit Risk, Market Risk, Economic Research, Technology, Strategic Planning, Global Research, HR and then there are all of the trading groups. Investment bankers work long and irregular hours to meet deadlines and close deals. They are often at their desks from before 8am until after 6pm or even up to as late as 9pm.

[Information on different roles in banking and finance:](#)

www.fssc.org.uk/directions,

www.bankingbasics.citigroup.com/buildabank/index.htm

www.oncampus.citi.com/careers/what_do_you_want_to_do.aspx

[Vacancies and current news:](#)

www.efinancialcareers.com

Typical starting salary: £30,000 + bonus.
With typical progression after 5-8 years
£65,000 - £100,000 + bonus.



How has your role and career subsequently progressed?

I was lucky in finding a ground-floor opportunity, however, the job is quite demanding with long hours - although the remuneration makes up for that. I changed jobs after a year and currently work for another Japanese Investment bank in the City as an Analyst within the Operations department. It can be very competitive getting your foot in the door within the Investment Banking sector but graduating with a Mathematics degree behind you will make a significant difference. One thing I will say is that when I was studying at Queen Mary, I didn't quite realise how important interview skills are and how stressful interviews can be!



First graduate job



Name: Noman Burki

Current role:
Senior Business Analyst

Undergraduate Programme:
BSc Mathematics and
Statistics at Queen Mary

Graduated: 2007

What was your experience of securing a full-time job?

When I graduated with a 1st Class Honours degree in Mathematics and Statistics I started applying for jobs straight away. I visited Queen Mary Careers for advice on the options open for me. Some of the advice I took on board was vital because as soon as you graduate all doors are

open for you but taking a step back and thinking before entering the door is important. I enjoyed statistics at degree level so I applied to the civil service as a statistical officer. I found working for the civil service great fun and I was able to pick up skills very quickly.

How has your career developed?

I wanted to be pushed more than in my role at the Civil Service and made the transition from the public sector to the private sector working for the largest bank in the UK, Royal Bank of Scotland (RBS) as a Senior Business Analyst. This role was very demanding both in the number of hours I had to work and in the technical challenges of learning new programming languages such as SQL and SAS. Working in a senior position helped me to pick up skills quicker and improve softer skills such as communication and being able to give presentations.

What does your job involve on a daily basis?

My work at RBS involves a mixture of day to day activities, like monitoring daily, weekly and monthly reports for our largest merchants; these reports help enhance additional income for the business. Alongside these reports we carry out ad-hoc requests that are logged and progress is monitored. We are at times under intense pressure with tight deadlines and high expectations. The rule of thumb is you must always check your work. My role is very technical and in it I use Microsoft Office as well as the other programming languages. These software packages are used to extract and manipulate large sets of data.

Get the facts: Government Statistical Service

The GSS comprises about 7,000 civil servants who work in either the Office for National Statistics (ONS), other Government Departments, and in the devolved administrations of Scotland and Wales.

As a graduate from a numerate discipline you would be eligible to apply as an Assistant Statistician or Statistical Officer. In either of these positions you can expect to be working on data collection, analysis and interpretation.

For more visit: www.ons.gov.uk

Typical starting salary - £22,000 - £24,000.
With typical progression after 4-5 years:
£36,000 - £51,000

What do you like about working where you are?

The best thing about working for a large bank is the variety of work, no two days are the same. Every day you are faced with different challenges so you must adapt to different situations. Since you are required to liaise with senior members of the business a professional approach is mandatory.

What is your advice to current students?

My advice to students would be to work hard at university. I believe you should always aim high and motivate yourself as this will help you develop skills and allow you to move on to bigger and better things. When you get a chance to present at university or are faced with a situation where you are offered a group leader role, I will encourage you to step forward as I did this and found it very useful. Remember to believe in life-long learning and that way you will always carry on developing and picking up new skills all the time.



First graduate job



Name: Mai Anh Du

Current role: Teacher

Undergraduate Programme:
Mathematics at Queen Mary

Graduated: 2003

Further study: Manchester
Metropolitan University,
PGCE.

How did you get into teaching?

I was lucky enough to know the only job I ever wanted to do was to be a teacher, and this determination helped me complete my degree. I found a Maths teacher role at the school and did my teacher training placement in Oldham, and

after 3 years earned a promotion with specific teaching and learning responsibility for Gifted and Talented students, mentoring staff and assessment for learning.

How has your career developed?

After 4 years at Failsworth School and with an Ofsted inspection lesson graded as “Outstanding”, I decided to further my career and moved into the management side of Secondary education. I applied successfully for the role of Assistant Director of Mathematics at Ladybridge High School in Bolton in 2008. Ladybridge is a multi-cultural school with students speaking over 30 different languages where I have had to learn how to be innovative in teaching and nurturing the students along with sharing my passion for the subject.

How has your degree helped you in your job?

My job involves a great deal of enthusiasm, commitment and organisation and the work ethic I learnt during my degree at Queen Mary prepared me for this. Every day is different and although challenging, my job provides me with a great deal of job satisfaction and happiness and overall it is incredibly rewarding. A High School teacher with a degree in a core subject such as mathematics is a prestigious qualification attracting a Head teacher’s attention. Although I do not teach the level of mathematics I learnt during my degree, I have used and developed the vital skills gained from my study to apply them throughout my career.

Get the facts: Teaching

There are a number of different ways you can train to be a primary or secondary school teacher, some with 'on the job' learning, others focused around further study. The most important thing for you to do is to get at least one week's work experience whilst you are at university. In addition, tutoring, mentoring and voluntary work with children and teenagers can help your teacher training application.

For more information on teacher training see: www.tda.gov.uk

London PGCE providers:

Institute of Education
www.ioe.ac.uk

London Metropolitan University
www.londonmet.ac.uk

University of East London
www.uel.ac.uk

Do you have advice for current students?

Though I did not leave college with a set of amazing A-Level grades, nor did I graduate from Queen Mary with an exceptionally high class mathematics degree, I still have a career that I am proud of and a job I look forward to going to every morning. I have just recently passed my assessment to become a qualified Advanced Skills Teacher working and liaising with schools in the Local Authority providing outreach work to support other Maths departments. In addition to this I am looking forward to my teacher exchange trip to visit schools in Mumbai, India in February 2011.



Once you have achieved qualified teacher status (QTS), you can expect to start as a newly qualified teacher (NQT) on £21,588 a year which rises the further you work into the centre of London. If you work in the inner London region this would be £27,000.

First graduate job



Name: Jabrul Hussain

Current role: Actuarial Trainee

Undergraduate Programme: BSc Mathematics and Statistics with Finance at Queen Mary

Graduated: 2008

Why did you choose to study this particular programme?

I chose this degree not only because I enjoyed solving mathematical problems but also because of the variety of career opportunities that may become available to me. This is one of the reasons why I decided to add Statistics and

Finance to my degree title. Looking back, the skills and knowledge that I obtained was enormously valuable in terms of the real working world.

How did it help you get the role that you are in today?

My first year was really interesting because we were taught a variety of modules however I found that I really enjoyed the aspects that covered statistics and numerical calculations. During the second year I studied a module called actuarial mathematics. I previously had interest in this area and whilst studying this module, I realised that I really enjoyed the variety of work that the subject offered. This helped confirm my decision to pursue a career as an actuary.

What was your experience of getting a full-time job?

Towards the end of my second year I began to apply for summer internships and placements in insurance and pension companies. For each application I had to complete a verbal and numerical reasoning test, which I initially found extremely difficult. However, after completing several applications and continued practice I was able to pass both sets of tests quite easily. Unfortunately I wasn't offered any interviews at that stage but I continued to apply to actuary departments for graduate roles during my final year. I was offered an interview for the Government's Actuary Department and also had an assessment centre for the Royal Bank of Scotland. Unfortunately, I wasn't successful but the feedback I received was invaluable. My third interview was with Prudential Assurance Services. I was offered a graduate scheme for the Stochastic Valuation Team under the With-Profits Management department and I now work on the Stochastic Modelling Team.

Get the facts: Actuary

The work of an Actuary is very diverse: it ranges from problem solving and analysis to consultancy and risk assessment. Actuaries are also in great demand across a number of different sectors, for example, banking, healthcare and insurance. Actuaries all generally have something in common – they enjoy mathematics! Depending on the sector you work in, you could be calculating life expectancies for a company's workforce to allow for appropriate decisions to be made in relation to pension provision. You could also find yourself developing a mathematical model that assesses a particular kind of risk to a business.

Further information can be at:

The Institute of Actuaries

www.actuaries.org.uk

www.fssc.org.uk/directions

www.prospects.ac.uk

Typical starting salary: £28,000 at a global insurance firm though this will rise to £42,000 - £55,000 for newly qualified actuaries

How has your degree helped you in your job?

In order for me to qualify I need to pass about 12 paper exams as well as attend and pass the relevant residential courses, work based skills essays and the modelling based exam. I was able to get an exemption due to taking certain courses on my degree. On average, it takes about 5 or 6 years to qualify so I have still got a long way to go!

What is a typical day like for you?

The day-to-day work (and exams) is extremely challenging but nonetheless enjoyable. I have found that I use a variety of skills that I learnt during my degree; in particular, the discipline and exam practice but also the softer skills such as communication skills and ability to take notes efficiently.

I use Excel, VBA (Visual Basic for Applications) and Moses on a daily basis. Although I was sufficiently competent with Excel during University I did not put as much effort into VBA. VBA is essential for anyone who wants to work in any environment that uses technical mathematical models and looking back, I regret not putting more effort into this application.

What advice would you give to current students?

I thoroughly enjoy working for a life insurance company in the financial environment because of the variety of work and also the financial rewards and I would urge anyone who would like to also pursue a career in this field to learn as much as they can during their degree, especially on aspects which may get missed out such as the communication skills and interview practice.



Long term gains from a mathematical sciences degree



Name: Malcolm Dyos

Current role: President of an engineering company

Undergraduate Programme: Mathematics

Graduated: 1959

What was it like graduating with a mathematics degree when you did?

I graduated what seems like a long time ago with a not very good degree in mathematics. It was an easy time then to find a good job and like many people I took the one that paid the most! Mathematics has been described as the “queen of sciences” and allowed me access to various different branches of engineering. Many people are in awe of a degree in mathematics and it

therefore quickly allows one the scope to be given varied and challenging positions.

How did your career then progress?

After working on the nuclear program to develop the UK’s nuclear capability, I wanted to travel and applied for a position in Australia. When I was there one of the first things they asked me to do was teach a university graduate course and mark degree papers. I also published research and then went to work in the USA, I have also been lucky enough to work in Singapore and South Africa.

What did your degree in mathematics give you?

Finding that people were very focused on their own discipline, I was able with the help of an analytical mathematical ability to integrate



Get the facts: Consultant mathematicians working in industry

several disciplines into one to provide for enhanced design optimisation. There is a high level of respect for those who have the ability to move through disciplines and gave me great exposure throughout the company. This and an ability to give presentations and a problem solving technique developed through solving mathematical problems led me to move up the management structure. Reducing complex problems into constituent parts and constructing analyses with the ability to arrive at conclusions has led me to where I am today as president of a large engineering company!



There are many instances that mathematicians have been consulted by industry to solve unique problems. In one such example an oil industry company needed to map accurately reservoirs beneath the seabed. Ships traverse across the sea using

echo sounding - a technique by which sound waves are emitted and captured as they bounce back from the seabed. Ships have to cover as much area as possible in the shortest amount time, whilst gathering the most data. Where and how to turn ships to get round in a minimum arc are critical to providing a good seismic survey. Mathematicians have developed and enhanced equations which underpin these decisions taking into account currents and wind speed.

Mathematicians have also helped improve the statistical expertise of a major UK energy company's staff, developing material which would fit in with the current Systematic Approach to Training which the company adopts. These topics included hypothesis testing, confidence intervals, Bayesian statistics and Monte-Carlo methods. The course was a mixture of theory, principles and hands-on practical exercises drawn from the company's own examples. In addition the Telecommunications sector have benefited from random geometric graphs to load balancing and resource allocation and the Insurance sector has enhanced their areas of multivariate analysis and dependency modeling



Long term gains from a mathematical sciences degree



Name: Dennis Cox

Current role: Chief Executive

Undergraduate programme:
Mathematics

Graduated: 1978

What happened in the early part of your career?

A modelling theme has been with me throughout my career. I began my career as an accountant where I found that my comfort with mathematics actually put me at a great advantage over many of my colleagues. The ability to understand patterns in data and interpret information, combined with knowledge of statistics and distributions really helped.

What happened next?

I embarked on forensic work using pattern analysis to identify inappropriate persons and developing a range of models for clients, using probability methods combined with economic skills. I enjoyed investigating many key financial problems from the Guinness takeover of Distillers to people stealing things such as gas and spark plugs - however not at the same time! I also investigated the theft of lots of money which all in all was rather interesting work - if a little dangerous.

How did your career develop from then on?

After writing the text: Banks: Accounts, Audit and Practice for Butterworths (1993) and after a number of jobs I became Director of Risk Management at Prudential Portfolio Managers. Here my team developed risk models for the largest fund manager in the UK, including new derivative models and stress models. I then rejoined HSBC in their insurance arm and developed modelling for operational risk. The job gave me the opportunity to travel in Australia and South Africa, together with Singapore, Hong Kong and the USA.



Which area of maths has been particularly relevant?

I believe that modelling has been a theme that has been with me throughout my career. In 2002 I formed Risk Reward Limited to provide risk management to the banks in the developing world at a price they could afford. We now trade (and I travel) to 43 countries from our Moorgate offices. I have written further books on money laundering and other topics and can say that mathematics and business have been the core of my career - using and interpreting data to identify problems and predict the future. A great place to spend your time and also one where few still dare to tread.



Get the facts: Management Consultancy

Management Consultants operate across a wide variety of services such as business strategy, marketing, financial and management controls, human resources, information technology, e-business and operations, and supply-chain management. One week you could be working with an IT firm helping them to implement a new HR policy, the next you could be working with the NHS helping them to identify areas where they can be more efficient and save money and/or improve health outcomes. You could find yourself carrying out research, analysing company information, talking to the company's client and presenting results and information to them.

For more information see:

www.prospects.ac.uk

www.ibconsulting.org.uk

www.get.hobsons.co.uk/advice/consultancy

Typical starting salary at a top firm in London can be £31,000 with an initial sign-on bonus of £10,000



Further Career Options

As well as the career options which have been discussed previously in this booklet, there are many other roles where mathematical sciences graduates are in demand. There are a huge number of possibilities available for using your skills in problem-solving, analysis and adopting a logical approach to your work. In addition there are other career options which are open to all graduates including further study in Law to become a solicitor or joining the Armed Forces or Police Force... to name but a few. If you are prepared to do your research then the opportunities really are endless. Here are further careers which are linked to your mathematical sciences degree that you might not have thought of:

Meteorologist

Meteorologists study weather systems and build mathematical models to help predict what the weather will be like. General activities involve collecting data from a range of sources around the world, including satellites and weather stations stationed on the ground, preparing briefings for clients and refining mathematical models used in prediction.

Further information can be found from the Met Office: www.metoffice.gov.uk

Typical starting salary: £18,500+



IT Consultant

As an IT consultant you would advise your clients on system implementation to satisfy a company objective or suggest the introduction of a system to improve productivity. This is a rounded job where you would need a good level of technical knowledge as well as reporting and presentation skills as you will be managing customer relationships. Problem solving is also a very important aspect of this job.

Further information can be found at:

Computing Careers:

www.computingcareers.co.uk or

Top IT Consultant: www.topitconsultant.co.uk

Typical starting salary: £23,000 - £32,000



Market Researcher

This role works to collect and analyse information in a variety of areas. The subject you are researching could be for a new product your company wants to launch or to estimate the impact of your website. Large supermarkets for example gather a large amount of information about what kinds of items customers with differing ages, sexes and location buy from their stores. This is a role involving lots of different relationships with people and hence team-work and communication skills are important.

Further information can be found at:

www.mrweb.com

Typical starting salary: £19,000 - £24,000



Notes



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