

Mathematics

Careers Advice

Prepared by



THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS

Welcome to the careers advice for the mathematics undergraduate, prepared by the Institute of Mathematics and its Applications (IMA). (*Shameless plug for the IMA can be found on the back page!*)

The IMA knows how fantastic mathematics graduates are to employ (we employ a couple ourselves!), with your highly developed numerical skills, logical thinking and ability to analyse difficult problems (to name a few qualities) and studies have shown that mathematics and computing graduates earn more over a lifetime than graduates of other degree subjects (compared to someone with only two or more A levels), but what career can a mathematics degree lead you to? Who employs mathematics graduates?

Deciding which career path you will embark on once you have graduated from university should not be taken lightly. Some people are lucky enough to already know what they want to do or have a job offer from the company where they spent their industrial placement year, but for others, with so many career options open to mathematics graduates, where do you begin?

This document has been designed to not only answer these questions, but also make you think about what you want to do and the skills you have, provide guidance on the careers open to mathematics graduates and what skills employers are looking for. It also encourages you to research the careers open to you as the information is out there. This is your future, nobody else will do this for you. Being a mathematics undergraduate, you shouldn't have any problems doing this in a logical and organised way!

What career can a mathematics degree lead you to?

I'm not going to mislead you, there are very few jobs titled 'Mathematician'. On the other hand, you may be feeling that you never want to see second-order partial differential equations or Lagrangian mechanics ever again! Fear not; a mathematics degree can open the door to a wide range of exciting careers, not just in finance, banking and teaching, as the skills gained from a mathematics degree are highly sought after in many different areas of employment. The collection of career profiles on the [MathsCareers](#) website of people who studied mathematics highlights the fact that there is no 'typical job' for a mathematics graduate.

Top Tip: Researching your future career is going to require more time and effort from you than someone doing a vocational degree. Why not spend a bit of your spare time on this?

Who employs mathematics graduates?

Mathematics graduates, with adequate employability skills (see page 4), are in high demand by employers, who are as varied and diverse as the roles that are open to an individual with a mathematics degree. While many large companies have their own recruiting programmes, many smaller, or less specifically mathematical, organisations and companies may also have roles which you may be suitable for.

Examples of the careers sectors, roles and employers a mathematics graduate can be employed in

In true careers advice style, we have examples of the careers sectors that mathematics graduates can work in, the roles they can undertake, employers in these career sectors and some useful websites. This information is presented in the table on the following page (large amounts of information presented logically, have you guessed that the author of this careers advice is a mathematics graduate?!?!)

Some things to remember about this table;

- ◆ This table is far from being a complete list of the different types of roles open to a mathematics graduate.
- ◆ According to the Prospects website, having a degree in mathematics will increase your chances of obtaining most of these roles.
- ◆ The roles listed that do not appear on the Prospects website have been added for variety.
- ◆ Don't forget, you can mix and match some of the jobs listed and the careers sectors. For example, you could be in a finance role at an engineering company.

Key to the table on page 3

*	Employers of IMA members
§	Graduate training schemes approved by the IMA for the Chartered Mathematician designation
Bold	IMA Corporate Affiliates

Top Tip: Check out the IMA's [Friends of Mathematics](#) for more employers of IMA members.

Careers Open to Mathematics Graduates

Sector	Jobs	Example Employers	Websites
Advertising & Marketing	Market Researcher Marketing Advertising Account Planner Social Researcher	IMS Research Knapp Goodwin	The Market Research Society Institute of Practitioners in Advertising
Business & Operational Research	Management Consultant Logistics Retail Merchandiser/Buyer Transport Planner Human Resources Officer Business Analyst	Cap Gemini* Wincanton Arcadia Group Ltd The Highways Agency*	Operational Research Society The Chartered Institute of Logistics & Transport (UK)
Civil Service	Defence Analyst Statistical Officer Cryptologist Operational Researcher Statistician	Dstl * [§] ONS* GCHQ * [§] GORS GSS	FastStream
Education	Teacher/lecturer	Primary* Secondary* Further Education* Universities*	TDA
Engineering	Aerodynamicist Aeronautical Engineer Communications Engineer Quantity Surveyor Principal Engineer Project Engineer Thermal/Structural Analyst	Rolls Royce * Thales * Vodafone * Ove Arup* QinetiQ * [§] Red Bull Racing British Energy* [§]	Enginuity
Finance & Banking	Auditor Banker Chartered Public Finance Accountant Chartered Accountant Tax Advisor Tax Inspector Investment Banker Financial Advisor City Trader Merchant Banker Investment Analyst Corporate Treasurer Commodity Broker	National Audit Office* JP Morgan Chase* PricewaterhouseCoopers * Deloitte* Ernst & Young* HM Revenue & Customs KPMG* Bank of England* [§] Deutsche Bank* Citigroup* HSBC* Grant Thornton HBOS Plc*	Association of Corporate Treasurers The Institute of Chartered Accountants in England and Wales
Insurance & Risk	Actuary Insurance Analyst Insurance Underwriter Insurance Broker Insurance Account Manager Insurance Claims Inspector Credit Analyst Pensions Advisor Financial Risk Analyst	AXA* Aviva* Legal & General* Prudential* Lloyds of London Standard Life* Aon* Pearl Group* Schroders	The Actuarial Profession The Chartered Insurance Institute
IT & Computers	Computer Game Designer Computer Programmer Software Developer Multimedia Programmer Database Administrator Applications Developer IT Consultant Network Engineer Software Engineer Systems Analyst Systems Developer	Eidos Interactive IBM* Havok Oracle* Hewlett Packard* Sun Microsystems* ANSYS Europe Ltd* Tessella Logica* Siemens Fujitsu Europe Ltd*	British Computer Society
Medicine and Health	Statistician Statistical Programmer Biometrist Data Analyst Biomedical Engineer	GlaxoSmithKline* Johnson & Johnson Pfizer* AstraZeneca* NHS*	Royal Statistical Society Statisticians in the Pharmaceutical Industry
The Natural and Life Sciences	Cartographer Hydrographic surveyor Land/geomatics Surveyor Hydrologist Seismic Interpreter Petroleum Engineer Geophysical Data Processor Biomathematician Meteorologist Oceanographer Research Scientist (Maths)	Ordnance Survey Port of London Authority Global Surveys Environment Agency* BP* Schlumberger* Institute of Food Research* The Met Office* Proudman Oceanographic Laboratory*	The British Cartographic Society International Federation of Hydrographic Societies Future Morph

Skills

What work-related skills do you gain from a mathematics degree?

The [Student Employability Profile](#) for a graduate in Mathematics, Statistics or Operational Research (MSOR) can answer this question. This profile identifies the skills that you may develop through studying Mathematics, which were then compared to the employability skills, competences and attributes valued by the Council for Industry and Higher Education (CIHE) Employer membership when recruiting. This document was produced by The Higher Education Academy with the help of the Subject Centres and the CIHE.

Top Tip: Download a copy of this profile and think of examples of where you have demonstrated each skill throughout your degree.

If you are looking for something a little more manageable, try the [Careers for Mathematicians](#) article.

Skills gained from other areas of life

We are aware that a mathematics degree might not provide the opportunity to develop certain skills that are handy in the workplace, such as team work and giving presentations. If you find this to be the case, look to part-time work, placement years, membership of societies and volunteering you have undertaken for more examples of where you have demonstrated your skills. For example, being commodore of the Sailing Club would demonstrate your leadership skills and a project you were involved in during your placement year will demonstrate your team working skills in the working environment.

Top Tip: Demonstrating your skills from a variety of areas of your life will make you seem more interesting to an employer (not a maths geek in sight!)

Skill wanted by employers

What is it that employers are looking for from graduates? Thanks to the *Education & Skills Survey 2008*, we now know! When asked to select their top three factors they consider when recruiting graduates, board executives said;

1. Positive attitude and employability skills (see below).
2. Work experience or an industrial placement year.
3. Degree subject studied.

Employability skills (as defined in the *Education & Skills Survey 2008*)

Self-management	Readiness to accept responsibility, flexibility, time management, readiness to improve own performance
Team working	Respecting others, co-operating, negotiating/persuading, contributing to discussions
Business and customer awareness	Basic understanding of the key drivers for business success and the need to provide customer satisfaction
Problem solving	Analysing facts and circumstances and applying creative thinking to develop appropriate solutions
Communication and literacy	Application of literacy, ability to produce clear, structured written work and oral literacy, including listening and questioning
Application of numeracy	Manipulation of numbers, general mathematical awareness and its application in practical contexts
Application of information technology	Basic IT skills, including familiarity with word processing, spreadsheets, file management and use of internet search engines

Employers are also looking for graduates to have business awareness and knowledge of their chosen career. However, the report also tells us that employers are concerned about the quality of graduates, believing that too many graduates do not have adequate employability skills that all businesses need. You have been warned!

The message to students and universities is clear: while obtaining a good degree result is important, it must be achieved alongside the development of valuable softer skills to make the most of their opportunities after graduation.

Education & Skills Survey 2008, CBI/Edexcel

Top Tip: Remember to use the best and most relevant examples you have for each job you apply for. Expand on the examples: what went well? what you would do differently? etc.

This preparation will help you to clarify in your own mind the skills you have gained from your mathematics degree and recognise the skills an employer is looking for. It can help you when filling in job applications or writing a cover letter for your CV and you will also have good examples ready to fire back with at interviews. After all, this is how employers are able to determine the best candidates for the job and your opportunity to sell yourself!

Some More Advice

Where do I begin?

The best place to start is with you! You need to figure out what you enjoy doing, what you want out of a job, what skills you have to offer employers etc. The [Prospects](#) website has Prospects Planner, a tool designed to match your degree subject, skills, interests and motivations to jobs in different career sectors. This may provide a useful starting point as you will decide how important different skills are to you in a job, e.g. giving presentations, team work etc.

Also think about the type of employer you would like to work for. Would you like to work for a big organisation or a smaller company? Would you like to join a graduate recruitment scheme? What about a career that uses the area of mathematics that you took during your degree that you enjoyed or were good at?

Top Tip: If you decide on your career early enough, you may be able to take modules available to you that will give you the skills you need, e.g. programming skills.

Researching your career

Now you know what careers are open to a mathematics graduate, you know where to look in your university's career service for more information about the different career sectors, careers available and employers to see what appeals to you. Websites such as Prospects, [GET by Hobsons](#) and [Milkround.com](#) can provide you with a wealth of information as well.

Top Tip: By looking at the current job vacancies on these websites before your final year, you will see which roles require a mathematics degree/degree in a numerate discipline, the employers and graduate recruitment schemes.

There's nothing or no one more qualified to tell you about a profession than an organisation dedicated to that profession. So take a look on that organisation's website as they usually provide careers advice.

Top Tip: If you're not sure a society exists for the profession you are interested in, use an internet search engine.

The [Society for Industrial and Applied Mathematics](#) (SIAM) has also produced a guide to [Careers in Applied Math](#), which identifies the career opportunities open to people with mathematical talent and training.

Further Study

Choosing to undertake further study after your degree can help you with your future career, but it can also be expensive and more demanding than an undergraduate degree. As further study requires you to specialise in a subject, you need to be absolutely sure that this is the path for you and that you will benefit from this option. So if you were planning on further study because you are unsure of what career is for you, then you might want to reconsider.

Some reasons for choosing further study include;

- ◆ A requirement to have a professional qualification, e.g. teaching.
- ◆ It is expected that you will have a higher degree, e.g. an academic researcher.
- ◆ Further study can allow you to change direction to a career sector that your mathematics degree may not have covered (known as a conversion course).
- ◆ You really enjoyed your mathematics degree and wish to specialise in one area of mathematics in particular.

Top Tip: The Prospects website or [FindaMasters.com](#) can help you find out what masters courses are out there.

Use the services offered by your University's careers service

The careers service at your university will not only have information on careers and employers, but they will also offer you help with your CV and completing job applications, which can help you over the first hurdle of job hunting, getting an interview! The careers service can also help you brush up on your interview techniques. Careers advisors should be able to provide you with more tailored advice when you have more of an idea of what you would like to do for a career.

Professional Societies and Mathematics Organisations

Join a Professional Society

You're probably thinking 'you would say that', but membership of a professional society brings with not only usual benefits, such as in-house publications, discounts, access to schemes offered to members etc, but also the opportunity to work with your chosen society to help advance your subject and be part of a community (wouldn't you like to be in a room full of people who don't look for the nearest exit when you tell them you are a mathematician?)

Or how about joining for your career? Professional societies provide networking opportunities, helping you to make contact with other professionals in your field, and keep you up to date with the latest developments in your profession.

Professional societies can recognise experience and skills you have gained in your career by the different grades of membership they offer. This not only tells employers that you are qualified in your subject, but that you have also reached a certain benchmark in your career.

Interestingly, membership of a professional society and holding a professional qualification can help you earn more. Research commissioned by the Consultative Committee for Professional Management Organisations found that such individuals earn on average £152,000 more over a lifetime (£81,000 from holding a professional qualification and £71,000 from being a member of a professional society). Their chances of being employed also increase by 9% because of the transferable skills on offer. Just goes to show that employers value highly the skills developed by professional societies.

Still not convinced? Then there's always the attraction of letters after your name and it looks good on your CV!

UK Mathematics Organisations

If you decide to join an organisation, as a recent mathematics graduate it is more than likely that you will join a mathematics organisation. If you feel that the IMA is not your cup of tea, there are a variety of other mathematics organisations you can join, such as;

- ◆ The Royal Statistical Society; the society for Statisticians. Did you know the Royal Statistical Society awards the Chartered Statistician designation?
- ◆ The Operational Research Society; the society dedicated to operational research.
- ◆ The [London Mathematical Society](#); the society those perusing a career in research may favour.
- ◆ The [Edinburgh Mathematical Society](#); the mathematical society for the university community in Scotland.

The IMA and the societies listed above are members of the [Council for the Mathematical Sciences](#).

***Top Tip:** Student membership is usually one of the cheaper rates of membership societies offer. So you could see if membership of a society is for you whilst you are still at university (if you have some of your student loan left!)*

And Finally...

...GOOD LUCK!

Website Directory

Web addresses for the websites mentioned previously in this document.

Website	Web Address
MathsCareers	www.mathscareers.org.uk
Friends of Mathematics	www.ima.org.uk/Professional/friends.html
The Market Research Society	www.mrs.org.uk
Institute of Practitioners in Advertising	www.ipa.co.uk
Operational Research Society	www.orsoc.org.uk
The Chartered Institute of Logistics & Transport (UK)	www.ciltuk.org.uk
FastStream	www.faststream.gov.uk
TDA	www.tda.gov.uk
Enginuity	www.enginuity.org.uk
Association of Corporate Treasurers	www.treasurers.org
The Institute of Chartered Accountants in England and Wales	www.icaew.co.uk
The Actuarial Profession	www.actuaries.org.uk
The Chartered Insurance Institute	www.cii.co.uk
British Computer Society	www.bcs.org
Royal Statistical Society	www.rss.org.uk
Statisticians in the Pharmaceutical Industry	www.psiweb.org
The British Cartographic Society	www.cartography.org.uk
International Federation of Hydrographic Societies	www.hydrographicsociety.org
Future Morph	www.futuremorph.org
Student Employability Profile	www.ima.org.uk/Careers/grads.htm
Careers for Mathematicians article	www.ima.org.uk/Careers/grads.htm
Prospects	www.prospects.ac.uk
GET by Hobsons	www.get.hobsons.co.uk
Milkround.com	www.milkround.com
Society for Industrial and Applied Mathematics	www.siam.org
Careers in Math	www.siam.org/careers/thinking/pdf/brochure.pdf
FindaMasters.com	www.findamasters.com
London Mathematical Society	www.lms.ac.uk
Edinburgh Mathematical Society	www.ems.ac.uk/wiki/tiki-index.php
The Council for the Mathematical Sciences	www.cms.ac.uk



THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS

What is the Institute of Mathematics and its Applications (IMA)?

All mathematics graduates, and individuals with an appreciation of mathematics, are welcome to join the IMA; the professional and learned society for qualified and practising mathematicians. We promote mathematics in commerce, education, industry, the public sector, and research, either independently or jointly with other UK mathematics organisations. We are the only organisation to award the Chartered Mathematician (CMath) designation.

Why should I join the IMA?

What better way to demonstrate your commitment to your career and mathematics than by joining a mathematics organisation.

The benefits for becoming a member of the IMA are;

- ◆ Recognition of qualifications and experience through the use of post nominals; designatory letters for Associate Members (AMIMA), Members (MIMA) and Fellows (FIMA).
- ◆ Stand out from the crowd by gaining the Chartered Mathematician designation!
- ◆ Help achieving the CMath designation through the Initial Professional Development Scheme, the Graduate Training Scheme and the Programme Approval scheme.
- ◆ Chartered Mathematics Teacher and Chartered Scientist designations also available.
- ◆ Keep up-to-date with developments in mathematics through the IMA's publication *Mathematics Today* (six issues per year).
- ◆ *eBULLETIN*.
- ◆ Join the Younger Members Group and attend the Younger Mathematicians conferences.
- ◆ Engage with your local branch.
- ◆ Opportunity to record your continuing professional development.
- ◆ Reduced rates for members at IMA conferences and to IMA journal subscriptions.

What is the Chartered Mathematician designation?

Graduating from university doesn't mean that your education ends there. To help you do your job better, you will need to stay up-to-date with developments in your field (known as professional development). The CMath designation recognises not only your academic qualification but also your professional development.

Being a Chartered Mathematician will;

- ◆ Identify you as being at the forefront of your profession.
- ◆ Broaden your career options.
- ◆ Provide employers with an assurance of expertise and competence.
- ◆ Encapsulate standards of professional excellence across mathematics in the 21st century.
- ◆ Benchmark you at the same level as a Chartered Engineer.

The standard route to gaining the CMath designation is;

- ◆ An MMath honours degree; or,
- ◆ A BSc honours degree in mathematics followed by either a higher level taught or research degree, or subsequent training and experience through employment; and,
- ◆ At least five years postgraduate training and experience, requiring the application of mathematical knowledge.

Full criteria details for the CMath designation, and details of the other chartered designations, are available on the IMA website.

So why not reward your hard work?

FIND OUT MORE ABOUT THE IMA IMA.ORG.UK

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