

MANCHESTER
1824

The University of Manchester

MATHEMATICS

POSTGRADUATE COURSES

SHAPE YOUR FUTURE

Learn today, lead tomorrow

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SHAPE YOUR FUTURE: CAREERS



Our Department is ranked eighth in the UK for the quality of our research. Overall research quality in REF 2021



Ranked top ten globally for action towards the UN Sustainable Development Goals. THE University Impact Rankings 2022



28th best university in the world, 9th in Europe and 6th in the UK. QS World Rankings 2023



Manchester has been voted the top city to live in the UK, and the third best in the world. The Economist's Global Liveability Index 2022 and Time Out Magazine survey (2021) respectively

[Read more about our rankings and reputation including REF results.](#)

CAREER CATEGORIES

Master's courses at The University of Manchester are designed to build the specialist knowledge and skills you need to enhance your employability and tackle the challenges facing our world today.

Our degrees are delivered with sustainability at their core, to give you the best grounding for the careers of the future. There are common themes and ideas that underpin our master's, which we have illustrated throughout this brochure. Look out for the following across our courses:

- A ENERGY CAREERS:** our master's courses equip you with first-class analytical skills that prepare you for careers in a world that is working through the energy transition.
- B BUILDING SUSTAINABLE FUTURES CAREERS:** securing existing infrastructures and planning for future sustainable developments are key aspects of our postgraduate courses.
- C LEADING CHANGE CAREERS:** a changing world requires new leadership, and our master's courses develop you as decision-makers and forward-thinkers.
- D INNOVATING TECHNOLOGY CAREERS:** as global priorities evolve, so do technological solutions. Our master's degrees train you in the most current technology and encourage innovations for our future.
- E RESEARCH FOR NEW HORIZONS:** our master's courses can lead you to further study with postgraduate research programmes (PhDs) where you will investigate solutions and methods for future science and engineering practitioners.

CAREERS SERVICE

As a postgraduate student you may already have a career path in mind, but we'll do all we can to help you get there. We'll give you the opportunities to develop your skills and networks, and support tailored to your needs.

[Our first-class Careers Service](#) offers support and advice throughout your time at The University of Manchester, to help you make the most of your time here and best prepare you for your future. From CV and application advice to employer workshops and our job platform Career Connect, the Careers Service for students and graduates can help to put you in the best position to secure employment and act as a launchpad for your long-term career aspirations.

SUSTAINABILITY

LEADING THE WORLD ON SUSTAINABLE DEVELOPMENT

The quality and scale of our research, when compared against the UN's Sustainable Development Goals (SDGs), has been ranked in the top ten globally by the [Times Higher Education University Impact Rankings in 2022](#).

The [17 SDGs](#) are the world's call to action on the most pressing challenges and opportunities facing humanity and the natural world, and we are playing a leading role in tackling them.

As one of the world's leading research institutions, as well as being the only university in the UK to have social responsibility as a core goal, The University of Manchester is proactively tackling the SDGs in four ways – through our research, learning and students, public engagement activities and responsible campus operations.

Our [2021/22 SDG report](#) outlines how we are tackling the SDGs.



OUR MASTER'S COURSES CONNECT WITH THE FOLLOWING UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

- Goal 4: Quality education
- Goal 8: Decent work and economic growth
- Goal 9: Industry, innovation and infrastructure
- Goal 17: Partnerships for the goals

FACILITIES AND RESOURCES

DEPARTMENT OF MATHEMATICS

The Department of Mathematics is based in the Alan Turing Building. Alan Turing was a Reader in Mathematics at Manchester and is regarded as one of the founders of computer science. Our facilities have been designed to meet the flexible needs of teaching and research. Whether you're a student, member of staff, or visitor, the spaces we offer are comfortable and fully equipped for a range of activities.

The department has an array of excellent computing facilities for high-performance, resource-heavy tasks, as well up-to-date software packages for everyday use. From our library with its vast depth of literary resources to the fantastic electronic resources we have available, we have access to an outstanding learning environment.

Taught master's students have access to the MSc study room, which houses a number of Linux-based systems and a small library of mathematical texts. Shared study spaces with a number of blackboards are also available outside of the research seminar rooms.

[Discover more about our facilities online.](#)



MSC ACTUARIAL SCIENCE

[Read more about this course](#)

This course provides a strong grounding in the mathematics of actuarial science, addressing both the current and future needs of the industry. The course was recently established and incorporates mathematical techniques that are crucial to a modern actuary, particularly from the fields of probability and statistics.

Our course offers the following exemptions under the IFoA's new Curriculum 2019: CS1, CS2 (Actuarial Statistics) and CM2 (Actuarial Mathematics).

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

B BUILDING SUSTAINABLE FUTURES CAREERS

C LEADING CHANGE CAREERS

D INNOVATING TECHNOLOGY CAREERS

WHAT DO OUR GRADUATES DO?

- Actuarial Analyst
- Actuarial Finance Lecturer
- Portfolio Analyst
- Actuarial Associate
- Insurance Actuary

WHERE OUR GRADUATES WORK

A career in actuary will provide a platform into a broad range of industries. These include insurance companies working in areas such as product development, pricing strategy, asset and liability management and risk management. Graduates also go to work for financial consultancy firms and sectors including investment management, corporate finance, and banking.

"The postgraduate study experience at Manchester University helped me build up a strong knowledge basis and obtain many network opportunities for my career. The combination of math, statistics and finance really provided me the solid understanding about the subject. I also enjoyed those extracurricular activities that made me feel like I was supported and motivated."

Ziying Grace Bi

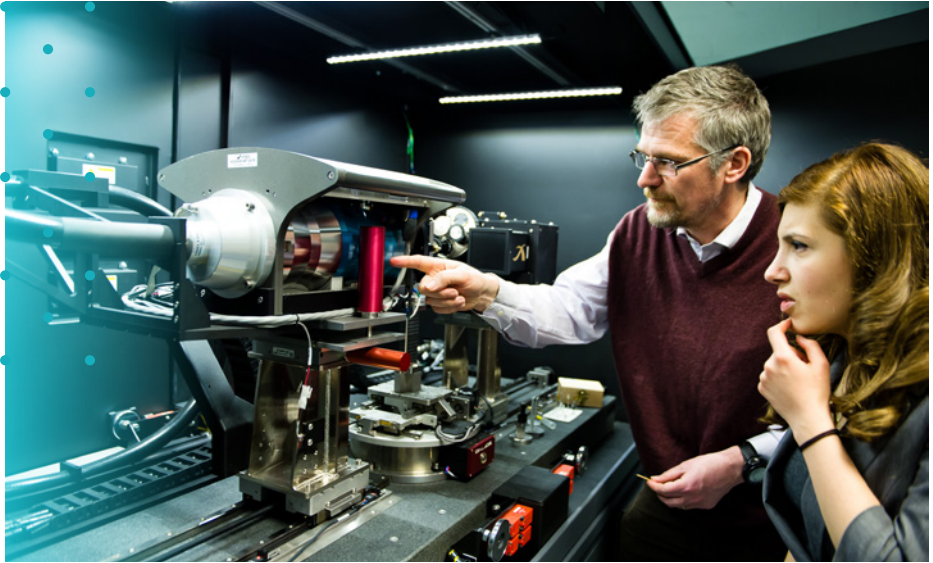
Master's degree in Actuarial Science graduate

Now working at PingAn Life Insurance as an actuarial assistant.



COURSES IN RELATED SUBJECT AREAS:

Mathematics, Mathematical Finance and MSc Statistics



- Royal London
- KPMG
- Police Mutual
- Bank of China
- Arch Insurance Group
- Chedid Capital

ENTRY REQUIREMENTS AND PREREQUISITES:

The standard entry requirement is a 2.1 UK honours degree or equivalent in Mathematics/ Statistics, a science degree with a strong quantitative component, a subject with substantial mathematical content, or equivalent overseas qualification in a mathematical subject. In particular, knowledge of probability and statistics equivalent to good second-year undergraduate Mathematics degree level is required for entry to the course.

Applicants are required to demonstrate competency in English language.

[Details of all the entry requirements and accepted qualifications.](#)



This course accredited by IFoA with professional exemptions awarded subject to satisfactory performance

MSC MATHEMATICAL FINANCE

[Read more about this course](#)

This course is jointly run with the Department of Mathematics and the Alliance Manchester Business School at the University of Manchester

Delivered from a genuinely international and multi-cultural perspective, this course will provide you with an advanced knowledge and understanding of the main theoretical and applied concepts in Mathematical Finance.

This MSc combines the academic strength and practical expertise of the Department of Mathematics and the Alliance Manchester Business School to provide you with both a mathematical and economic perspective.

You will focus on mathematical theory and modelling, drawing from the disciplines of probability theory, scientific computing and partial differential equations to derive relations between asset prices and interest rates, and to develop models for pricing, risk management and financial product development.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

C LEADING CHANGE CAREERS

WHERE DO OUR GRADUATES WORK?

- The University of Manchester
- Safecap Investments Limited
- Moody's Analytics
- Baker Tilly Cyprus
- Lloyds Bank

"During this MSc I completed a dissertation on "The Behaviour of the Free Boundary in American Options", which made me want to embark on a career in the finance sector. In addition to providing me with an insight into the financial world, I acquired skills that I can hopefully carry on to further develop and apply in a working environment."

Ana-wen Zang
BSc Actuarial Science and Mathematics and
MSc Mathematical Finance graduate
Now started on the KPMG Deal Advisory Graduate Trainee - Intensive course



OTHER RELATED COURSES:

Mathematics

WHAT DO OUR GRADUATES DO?

- Operational Risk Manager
- Reassurance Analyst
- Software Engineer
- Audit Associate
- PhD Financial Mathematics

The finance industry demands recruits with strong quantitative skills and this course is intended to prepare students for careers in this area. The course provides training for those who seek a career in the finance industry specialising in derivative securities, investment, risk management and hedge funds. It also provides research skills for those who subsequently wish to pursue research and/or an academic career or continue the study at doctoral level, particularly those wishing to pursue further/advanced studies in Mathematical Finance.

ENTRY REQUIREMENTS AND PREREQUISITES:

[To learn more about the desired background and experience required for this course, please see our full entry requirements.](#)

Some general expectations are listed below, with references to existing courses on that material in Manchester. We would only consider a few of these courses as essential, but some additional background is desirable and will certainly assist you for course preparation.

- A good background in Probability Theory is essential, e.g., two courses in Probability, Probability 1 and Probability 2.
- Knowledge of Statistics is highly desirable, e.g., Introduction to Statistics. More advanced courses in Probability are highly desirable, e.g., Foundations of Modern Probability.
- Knowledge of measure-theoretical Probability and/or measure theory is desirable as well. An introduction to Markov processes is desirable but not essential, e.g., Random models or Markov processes, but not essential.
- Knowledge of real analysis is essential and of complex analysis is desirable, e.g., Real and Complex Analysis.
- Knowledge of basic calculus, e.g., Calculus and Vectors A, and ordinary differential equations is essential, Calculus and Applications A.
- Knowledge of partial differential equations is highly desirable, e.g., Partial Differential Equations and Vector Calculus A.
- Knowledge of solving partial differential equations numerically is desirable but not essential.
- Although there is no formal requirement for previous programming experience, a familiarity with writing computer courses (e.g., in Python, MATLAB, C/C++ or Java) is desirable

IELTS: at least 6.5 overall with 6.5 in writing and no other sub-test less than 6.0.

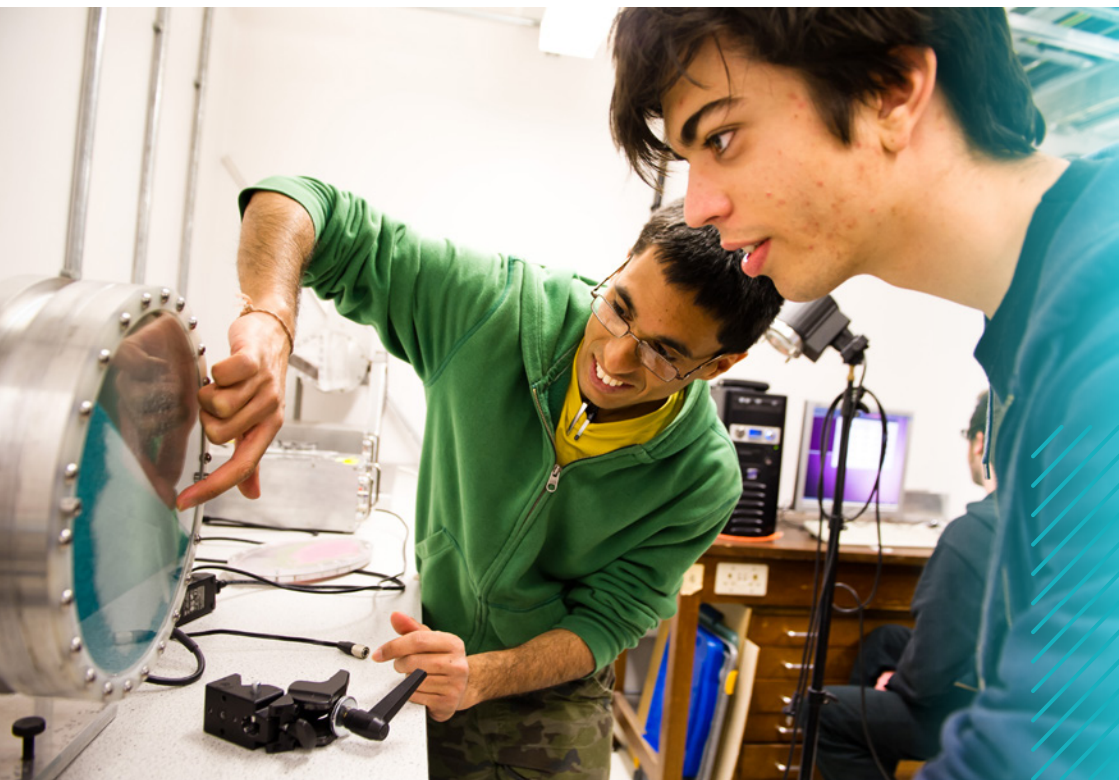
MSC PURE MATHEMATICS (MATHEMATICAL LOGIC PATHWAY)

[Read more about this course](#)

If you'd like to improve your background knowledge prior to applying to undertake a PhD by research, or if you wish to enhance your knowledge of postgraduate-level abstract mathematics, this may be the course for you.

You'll have the freedom to choose exclusively pure topics or a mixture of pure mathematics units and mathematical logic units. During the taught component of the course, you will normally take six units together with a research skills and project unit, in which you will first complete a mini project to improve mathematical writing skills and then undertake a full research project.

Within two weeks from the start of the academic year, students in this course can opt to change to the Mathematical Logic Pathway leading to the degree of MSc in Pure Mathematics and Mathematical Logic.



OTHER RELATED COURSES:

MSc Pure Mathematics and Mathematical Logic, MSc Mathematics, MSc Artificial Intelligence, MSc Computer Security, and MSc Advanced Computer Science

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

E RESEARCH FOR NEW HORIZON

WHERE DO OUR GRADUATES WORK?

- Oracle
- Alliance Manchester Business School
- Scottish Life
- AT&T Labs
- NHS

WHAT DO OUR GRADUATES DO?

- Teacher
- Research Associate
- Software Engineer
- Chief Financial Officer
- CEO

We tailor the course to the interests of our individual students in order to prepare them for a broad scope of career prospects. The course provides several opportunities for students to study advance topics in mathematics as a foundation for doctoral studies (PhD) or more applied courses. In current times, there is no shortage of intellectually challenging careers for a Pure Mathematics graduate.

ENTRY REQUIREMENTS AND PREREQUISITES:

The entry requirement to the courses is normally a good honours degree in mathematics or a mathematically related discipline or equivalent overseas qualification in a mathematical subject.

IELTS: at least 6.5 overall with no sub-test below 6.0.

MSC STATISTICS

[Read more about this course](#)

Receive thorough, professional training with this course, which will prepare you to embark on statistical careers in a variety of areas. There is a shortage of statisticians trained to postgraduate level in the UK, meaning that you will be a highly desired candidate upon completion of this MSc. The course also provides a very good foundation for further study at PhD level.

Our current MSc course in Statistics gives you the freedom to take a common core of five modules as well as three specialist/additional modules depending on your interests and career aspirations.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

C LEADING CHANGE CAREERS

WHERE DO OUR GRADUATES WORK?

- Hellenic Bank
- University of Bristol
- Simmondley Dental Practice
- App Annie
- Micro-Pensions Systems

WHAT DO OUR GRADUATES DO?

- Lecturer
- Biostatistician
- Data Analyst
- Project Manager
- Mathematics Teacher
- Analyst

This course will prepare students for a broad range of statistical careers, particularly in the financial, medical, pharmaceutical and industrial sectors of the economy, but also with local and national government agencies, as well as in other areas. It will also provide an excellent foundation for students wishing to pursue advanced postgraduate research in statistics.

"I had an amazing experience during my Master's year in Manchester. The course is well structured with a comprehensive set of modules that help me to build a solid academic background for pursuing a career in data science and statistics. The knowledge and experiences I got from this degree are useful for careers in many industries, including the insurance industry in which I am currently working."

Yi Lu

MSc Statistics graduate

Now working as a Lead Data Scientist for MSAmIn



OTHER RELATED COURSES:

Mathematics and Statistics



ENTRY REQUIREMENTS AND PREREQUISITES:

The standard entry requirement is a first UK honours degree or equivalent. You are expected to have a first degree with a substantial amount of mathematics including Probability and Statistics.

As a minimum you should have done Calculus or Mathematical Analysis, Linear Algebra, two courses in Probability and two courses in Statistics. A Mathematical Statistics course may count as one Probability and one Statistics course depending on the syllabus. If your course is called Advanced Mathematics, then we need to know how much calculus/linear algebra it contains.

Applicants are required to demonstrate competency in English language. [For details of all the accepted qualifications.](#)



This course is accredited by the Royal Statistical Society.

PRACTICALITIES

PRACTICALITIES - FEES, FUNDING, AND SCHOLARSHIPS

Your master's fees will cover the cost of your study at the University as well as charges for registration, tuition, supervision, examinations, and graduation. Tuition fees also entitle you to membership of our libraries, the Students' Union, and the Athletic Union.

If you require funding for your master's course, it is advised that you begin looking as soon as possible. A range of funding options may be available to you, which will differ depending on whether you are a student from the UK or an international student (including the EU).

Check the tuition fees for your chosen course, your fee status, and funding opportunities by visiting our [master's fees and funding webpage](#).





ACCOMMODATION

For most of you, Manchester won't just be your next stage of education; it'll be your new home for a year or more. From the moment you arrive, you'll be able to access support to help you make the most of your time in university accommodation. You'll find a range of accommodation options for postgraduate students, from contemporary and traditional halls of residence to a specialist advice service for those interested in private letting.

An offer of residence in university accommodation is guaranteed to all overseas postgraduate students for the duration of their studies, provided they meet conditions related to offer holder status and study mode. If your application falls outside the conditions of the guarantee, you are still welcome to apply for university accommodation.

Find out more on the [accommodation website](#) or explore our [interactive map](#).

This brochure was created in 2022/2023. It has therefore been created in advance of course starting dates and for this reason, course information may be amended prior to you applying for a place. There are a number of reasons why changes to course information and/or published term dates may need to be made prior to you applying for a place – more details can be found on our website. Prospective students are therefore reminded that they are responsible for ensuring, prior to applying to study, that they review up-to-date course information by searching for the relevant course at: manchester.ac.uk/study/masters/courses/

Further information describing the teaching, examination, assessment, and other educational services offered by The University of Manchester is available at: manchester.ac.uk/study/masters/

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