

# G111: Mathematics and Statistics



Undergraduate BSc 2021

## Essentials

**Please note:** 2020-21 courses may be affected by Covid-19 and are therefore subject to change due to the ongoing impact of Covid-19. Summaries of course-specific changes resulting from the impact of Covid-19 will be provided to applicants during August 2020.

For the latest information on our plans for teaching in academic year 2020/21 in light of Covid-19, please see [www.durham.ac.uk/coronavirus](http://www.durham.ac.uk/coronavirus)

<b>UCAS code</b>	G111
<b>Degree</b>	BSc
<b>Mode of study</b>	Full Time
<b>Duration</b>	3 years
<b>Location</b>	Durham City ( <a href="http://www.durham.ac.uk/study/location/durham.city">www.durham.ac.uk/study/location/durham.city</a> )
<b>A-Level</b>	A*A*A/A*AA
<b>BTEC</b>	D*D*D/D*DD
<b>International Baccalaureate</b>	38
<b>Alternative qualifications</b>	<ul style="list-style-type: none"> <li>• Other UK qualifications (<a href="http://www.dur.ac.uk/resources/undergraduate/apply/UK.pdf">www.dur.ac.uk/resources/undergraduate/apply/UK.pdf</a>)</li> <li>• EU qualifications (<a href="http://www.dur.ac.uk/resources/undergraduate/apply/EU.pdf">www.dur.ac.uk/resources/undergraduate/apply/EU.pdf</a>)</li> <li>• International qualifications (<a href="http://www.dur.ac.uk/international/country.information/">www.dur.ac.uk/international/country.information/</a>)</li> </ul>
<b>Contextual Offers</b>	You may be eligible for an offer which is one or two grades lower than our standard entry requirements. Find out more ( <a href="http://www.durham.ac.uk/study/ug/apply/contextualoffers/">www.durham.ac.uk/study/ug/apply/contextualoffers/</a> ).
<b>More information</b>	Still have questions? ( <a href="http://www.durham.ac.uk/study/askus/">www.durham.ac.uk/study/askus/</a> )
<b>Department(s) Website</b>	<a href="http://www.durham.ac.uk/mathematical.sciences">www.durham.ac.uk/mathematical.sciences</a>

## Course Summary

### Description

The three-year BSc Maths and Stats course combines a strong foundation in core mathematics and statistics with exciting recent developments in statistics and machine learning, providing a unique preparation for our data-driven future. A rigorous grounding in essential mathematical techniques and fundamental statistical principles and methods leads to the exploration of a wide range of topics central to modern statistics and machine learning, together with a year-long individual project module tackling a theoretical area or an applied problem in particular depth, possibly in collaboration with a company or other organisation.

### Year 1

The first year consists of 100 compulsory Mathematics credits:

- Analysis (20)
- Calculus (20)
- Linear Algebra (20)
- Dynamics (10)
- Probability (10)
- Programming (10)
- Statistics (10)

Together with a further 20 credits which can be chosen from:

- Discrete Mathematics (20)
- Any other available Sciences, Arts and Social Sciences modules (subject to pre-requisites and timetabling compatibility)

The first-year Mathematics modules expand and develop topics that may be familiar from A level (or equivalent), smoothing the transition to university study. Fundamental statistical methodologies are developed from first principles in the Statistics and Probability modules, providing a mathematical language and coherent conceptual framework with which to structure subsequent developments. Other modules equip you with the essential mathematical tools needed for further study.

### Year 2

In the second year, you will take four compulsory modules (60 credits):

- Analysis in Many Variables (20)
- Statistical Inference (20)
- Data Science and Statistical Computing (10)
- Statistical Modelling (10)

Together with a further 60 credits which can be chosen from a wide range, including:

- Complex Analysis (20)

- Numerical Analysis (20)
- Markov Chains (10)
- Mathematical Modelling (10)
- Probability (10)

The four compulsory modules will furnish you with the central mathematical, inferential, modelling, and computational tools needed for modern statistics and machine learning, as well as looking at important surrounding issues such as data governance. Further modules allow you to broaden or deepen your knowledge of particular topics or techniques.

### **Year 3**

In the third year, you take a 40-credit capstone project module, tackling a theoretical area or an applied problem in particular depth. Subject to availability, this may be performed in collaboration with a company or other organisation. For the remaining 80 credits, you choose from a range of modules on topics central to modern statistics and machine learning, including:

- Advanced Statistical Modelling (20)
- Bayesian Computation and Modelling (20)
- Decision Theory (20)
- Machine Learning and Neural Networks (20)
- Mathematical Finance (20)
- Stochastic Processes (20).

### **Study Abroad**

We are part of the SOCRATES / ERASMUS programme which encourages students to study for part of their course in university of another EU country. We have links with universities where courses are taught in French, German, Italian and Spanish – currently in Berlin, Bochum, Bologna, Chambéry, Duisburg, Fribourg, Granada, Mons and Strasbourg. Admission to any of our partner universities via the Erasmus programme is contingent upon admittance by the host institution, availability of places, suitable modules in the corresponding academic year, and renewal of requisite exchange agreements.

### **Placement Year**

You may be able to take a work placement. Find out more ([www.durham.ac.uk/placements/](http://www.durham.ac.uk/placements/)).

## Admissions Process

### Subject requirements, level and grade

#### A level offer – A\*A\*A-A\*AA.

Suitable performance in the University Admission Tests TMUA or MAT or 1 in any STEP will lead to the lower A\*AA offer (A\*A in Mathematics and Further Mathematics, either way round plus A in any other A level or equivalent).

**BTEC Level 3 National Extended Diploma / OCR Cambridge Technical Extended Diploma – D\*D\*D – D\*DD** and A level requirements as above.

**IB Diploma score – 38** with 776 or 766 in higher level subjects.

In addition to satisfying the University's general entry requirements, please note that:

- We strongly encourage applicants to sit the University's Admissions Test (\*) if it is available to them, as we give a high weighting in our selection process to evidence of ability in Mathematics.
- We welcome applications from those with other qualifications equivalent to our standard entry requirements and from mature students with non-standard qualifications or who may have had a break in their study. Please contact our Admissions Selectors.
- If you are an international student who does not meet the requirements for direct entry to this degree you may be eligible to take an International Foundation Year pathway programme at the Durham University International Study Centre ([www.durhamisc.com/](http://www.durhamisc.com/))
- We are pleased to consider applications for deferred entry, although we advise you to make sure that you take steps to maintain your level of mathematical expertise.

*(\*) The University uses a national Admission Test in Mathematics (TMUA), in conjunction with the Cambridge Assessment Admissions Testing (CAAT). Test results will be sent by the CAAT directly to students at the end of November, and all information concerning the Test (including whether it was taken at all) will be provided to us by the applicants on an entirely voluntarily basis: suitable performance will entitle the applicant to the reduced A\*AA offer. Taking part in the TMUA can therefore only increase the chances of receiving an offer. More information can be found on the Mathematics Department website, on the CAAT website and in most schools nationwide. (Schools that currently administer STEP and MAT will be automatically registered).*

### English Language requirements

Please check requirements for your subject and level of study ([www.durham.ac.uk/learningandteaching.handbook/1/3/3/](http://www.durham.ac.uk/learningandteaching.handbook/1/3/3/))

### How to apply

[www.durham.ac.uk/undergraduate/apply](http://www.durham.ac.uk/undergraduate/apply)

**Information relevant to your country**

[www.durham.ac.uk/international/country.information/](http://www.durham.ac.uk/international/country.information/)

## Fees and Funding

### Full Time Fees

<b>EU Student</b>	£23,400.00 per year
<b>Home Student</b>	£9,250.00 per year
<b>Island Student</b>	£9,250.00 per year
<b>International non-EU Student</b>	£23,400.00 per year

International applicants for this course are automatically considered for the International Excellence Scholarships ([www.dur.ac.uk/study/ug/finance/international/scholarships](http://www.dur.ac.uk/study/ug/finance/international/scholarships))

The tuition fees shown for **home** students are for one complete academic year of full time study and are set according to the academic year of entry. Fees for subsequent years of your course may rise in line with an inflationary uplift as determined by the government.

The tuition fees shown for **overseas and EU** students are for one complete academic year of full time study, are set according to the academic year of entry, and remain the same throughout the duration of the programme for that cohort (**unless otherwise stated**).

Please also check costs for colleges and accommodation ([www.durham.ac.uk/undergraduate/accommodation/costs/](http://www.durham.ac.uk/undergraduate/accommodation/costs/)).

### Scholarships and funding

[www.durham.ac.uk/undergraduate/finance](http://www.durham.ac.uk/undergraduate/finance)

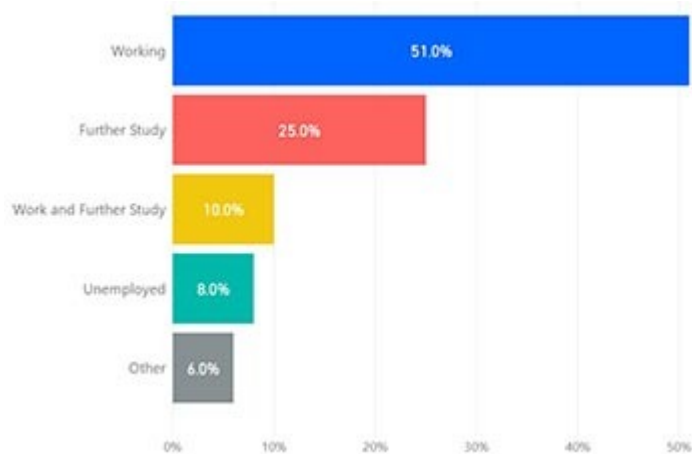
## Career Opportunities

### Mathematical Sciences

The overall aim of our honours mathematics programmes is to train our students as members of the community of professional mathematicians. Our programmes aim to develop students' capacity for critical thinking, problem-solving and independent learning, which will enable our students to meet a variety of challenges. We seek to develop both the generic and subject-specific skills required to equip our students to pursue a range of careers.

Opportunities for students to develop their understanding of mathematics as a professional practice and to prepare for work are not only provided by the formal degree programme. The department works closely with its students through the undergraduate MathSoc to attract exciting external speakers for its undergraduate colloquium programme.

“ Attributes gained from a Durham University degree include critical thinking, an analytical approach and ability to reason with information; alongside experience in building relationships and leading teams. These skills are put into daily practice in Professional Services and is why, year on year, we return to Durham University to recruit such talented individuals into our Firm. ”



### Of those students that left in 2017:

- **87%** of Mathematical Sciences leavers secured employment and/or have gone to further study within 6 months of graduating

### Of those in employment:

- **93%** are in graduate level employment
- Median salary £28,500

## Of those in further study:

- 93% are in graduate level study

(Source: Destinations of Leavers from Higher Education (DLHE) survey of 2016/17 graduates. The DLHE survey asks leavers from higher education what they are doing six months after graduation. Full definitions for the DLHE Record can be found here: [www.hesa.ac.uk/support/definitions/destinations](http://www.hesa.ac.uk/support/definitions/destinations))

A significant number of Mathematical Sciences students progress onto higher level study following their degree. Some remain within their academic field of interest and pursue higher level research, notably at Durham but also other prestigious institutions including Bath, Cambridge, Imperial College London, Leeds and Sheffield. Others take a different route and pursue postgraduate programmes in related and non- related areas such as statistics, financial management, I.T software, environment/ conservation and teaching .

“ We have found Durham students to be adaptable, eager to learn and probably most important, able to get on with people very easily ”

## Employability development opportunities

- **Careers presentations** Presentations are delivered within the Department for the whole range of students, from the first year to penultimate and final year undergraduates.
- **Employability skills workshops** These are delivered by employers on a range of skills related topics to give you the best chance of success in your internship and graduate job applications. More information is available here ([www.dur.ac.uk/careers/students/employability/events/](http://www.dur.ac.uk/careers/students/employability/events/)).
- **Student led activities** The department encourages and initiates student led careers activities. They include the invitation of external speakers in the undergraduate colloquium as well as relevant workshops (recently on interview and assessment training and presentation skills). There is also a web page on careers created by students.
- **Careers information online** A DUO resource has been created with information for undergraduate and graduate students as well as staff. There are also forums for students to discuss experiences and for the department to publicise vacancies and opportunities.
- **Departmental advisors** As part of their general advice to students, departmental careers advisors encourage students to plan for their future careers, and can help students needing additional support who are encouraged to attend 1:1 Careers interviews ([www.dur.ac.uk/careers/students/careerplanning/appointments/](http://www.dur.ac.uk/careers/students/careerplanning/appointments/)).
- **Careers Centre website** This is a very useful resource ([www.dur.ac.uk/careers/](http://www.dur.ac.uk/careers/)) which details the full range of services available, along with excellent tips and advice to help you investigate the range of careers available.

## Careers

Durham University Mathematical Sciences graduates progress into a diverse range of careers and employment sectors. The public, and private sectors are all represented with graduates entering professions such as Accountancy, Actuarial Consultancy, Tax Adviser, Software Engineering, Teaching , Retail Management, Investment Analyst, Insurance, Operations Research, Statistician, Recruitment Consulting, Armed Services Officer and Public Health Information Analyst.



Examples of high profile recent employers include Ernst & Young, Goldman Sachs, RAF, Mars, NHS, HMRC Lane Clark & Peacock, Co-operative Group, BT, Deloitte.

## **Open days and visits**

### **Pre-application open day**

Pre-application open days are the best way to discover all you need to know about Durham University. With representatives from all relevant academic and support service departments, and opportunities to explore college options, the open days provide our prospective undergraduates with the full experience of Durham University.

Please see the following page for further details and information on how to book a place:  
[www.durham.ac.uk/opendays](http://www.durham.ac.uk/opendays)

### **Discover Durham Tours**

Discover Durham tours offer a brief introduction to the University. The tour begins at one of our undergraduate colleges, where you will receive an introductory talk from a member of college staff, followed by a tour of the college by current students.

[www.durham.ac.uk/undergraduate/live/visit/discoverdurham](http://www.durham.ac.uk/undergraduate/live/visit/discoverdurham)

### **Overseas Visit Schedule**

[www.durham.ac.uk/international/office/meetus](http://www.durham.ac.uk/international/office/meetus)

## Department Information

### Mathematical Sciences

#### Overview

We offer stimulating, flexible and intellectually satisfying degrees. Whether you are looking for a Single Honours degree, or

Whether you are looking for a Single Honours degree, or wish to combine Mathematics with other subjects, Durham University offers a distinct blend of high-quality teaching and research along with excellent facilities and a stimulating environment for your studies. Whichever degree you choose, you will benefit from research-led education by experts in a wide variety of fields across pure mathematics, applied mathematics, statistics and probability.

- 5th in *The Times and Sunday Times Good University Guide 2020*.
- 4th in *The Complete University Guide 2020*.

#### Staff

For a current list of staff, please see the Mathematical Sciences department web pages ([www.dur.ac.uk/mathematical.sciences/staff/](http://www.dur.ac.uk/mathematical.sciences/staff/)).

#### Facilities

In addition to the large collection of mathematics books in the Bill Bryson Library, the college libraries may also have copies of recommended texts. The Department also provides a great deal of support material online and students are welcome to discuss any mathematical questions with their lecturers and tutors.

#### Website

[www.durham.ac.uk/mathematical.sciences](http://www.durham.ac.uk/mathematical.sciences)

---

This document was downloaded on Sunday, 25th October 2020 at 5:44pm from [www.durham.ac.uk/courses/info/?id=26956&title=Mathematics%20and%20Statistics&pdf](http://www.durham.ac.uk/courses/info/?id=26956&title=Mathematics%20and%20Statistics&pdf).  
The information relating to this course was last updated on Tuesday, 31st March 2020 at 5:05pm