Mathematics & Statistics

Degree options

MMath (Single Honours Degrees)
Mathematics
Applied Mathematics
Pure Mathematics
Statistics

BSc or MA (Single Honours Degrees)
Mathematics
Statistics

(If you wish to study Arts subjects in your first and second years, apply for the MA rather than the BSc degree.)

BSc (Joint Honours Degrees)
Mathematics and one of:
Biology
Chemistry
Computer Science
Economics
Geography

Statistics and one of:
Biology
Computer Science
Economics

BSc “With” Degree
Honours in which two-thirds of the course deals with the first-named subject:
Mathematics with Geography

MPhys (Joint Honours Degree)
Mathematics and Theoretical Physics

MChem (“With” Degree)
Chemistry with Mathematics

MA (Joint Honours Degrees)
Mathematics and one of:
Ancient History
Arabic
Art History
Biblical Studies
Classical Studies
Economics
English
German
Hebrew
International Relations

Statistics and one of:
Economics

MA “With” Degrees
Honours in which two-thirds of the course deals with the first-named subject:
Mathematics with Russian
Mathematics with Spanish

Entrance Requirements

First Year Entry
(To complete an MMath in five years, or a BSc in four)
SQA Highers: AAAB (A in Mathematics)
GCE A-Levels: AAA (A in Mathematics)
International Baccalaureate Points: 36 including HL6 in Mathematics

Second Year Entry
(To complete an MMath in four years or a BSc in three)
SQA Advanced Highers: AA including Mathematics (in addition to normal entrance requirements)
GCE A-Levels: AAA (A in Mathematics and Further Mathematics)
International Baccalaureate Points: 38 including HL6 in Mathematics

For Fast Track MMath Degrees
(To complete an MMath in four years, starting with 1000-level modules)
Advanced SQA Highers: BB including Mathematics
(in addition to normal entrance requirements)
GCE A-Levels: AAA (A in Mathematics)
International Baccalaureate Points: 36 including HL6 in Mathematics

Further country-specific qualifications:
www.st-andrews.ac.uk/admissions/entrancerequirements

Do I need previous knowledge of this subject? – Yes, see above.

Subject enquiries

Dr Colva M Roney-Dougal
E: maths-admissions@mcs.st-andrews.ac.uk
“At school I loved the fun and challenges that maths and statistics offered and this enthusiasm for the subject has continued and grown at university as I have discovered new and fascinating areas of maths. Statistics is such a useful subject (as my friends studying other subjects have discovered) and the modules on offer give you both knowledge and practical experience of the subject.”

Alison (Milton Keynes, Buckinghamshire, England)

**Features**

- We offer a wide variety of ways you can study mathematics, via first year entry, second year entry or Fast Track.
- To complement this, our degrees are extremely flexible: on arrival you will discuss with your Adviser of Studies which of these three routes would suit you best.
- All degrees have a flexible structure that allows you either to specialise in some particular area (e.g. Pure, Applied or Statistics) or to acquire training across a broader range of topics.
- Strong tutorial support throughout your undergraduate programme with weekly, small group tutorials for all courses in the early years.
- Opportunities to work closely, and undertake project work, with a research group.
- First-rate facilities and environment.
- Individual supervision in your final year of your Senior Honours Project.
- The School of Mathematics & Statistics was rated top in Scotland and Applied Mathematics was rated equal fourth in the United Kingdom in the most recent Research Assessment Exercise.

**What will I study?**

St Andrews provides a stimulating environment in which to pursue Mathematics or Statistics under the tutelage of world-class researchers. Not only will you have the opportunity to pursue an area of interest but also you will acquire the skills and attributes sought after by graduate employers. St Andrews has first-class researchers in the three main areas of mathematical science: Pure, Applied and Statistics. The School of Mathematics & Statistics has several internationally recognised centres, including the Centre for Interdisciplinary Research in Computational Algebra, the Centre for Research into Ecological and Environmental Modelling and the Solar and Magnetospheric MHD Theory Group. The undergraduate courses offered reflect this diversity of interests and provide the focus for specialisation and project work.

Understanding patterns and structure, and developing the tools with which to analyse them, is the primary focus of all mathematics. Whether the patterns relate to physical or biological phenomena or to the structure of mathematics itself, the primary aim is to describe, categorise, and understand the processes involved. As a student of Mathematics or Statistics, much of your time here will be concerned with developing the analytic techniques and skills necessary to explore some of these fascinating areas of research. Also, as a consequence of this diversity, we offer a wide range of degrees.

“I have been able to experience both the theory and application of lots of varied topics, which makes for interesting lectures and enjoyable study.”

Fearghas (Hemel Hempstead, Hertfordshire, England)
Degree programmes offered
These range from the advanced MMath programmes to the more broadly based Joint Degrees with another subject. Both Single and Joint Degrees are generally four years long, and are based upon a flexible and innovative module structure built around a core of essential material.

When you are applying, you may not be sure of the type of programme that will most suit you. If you expect to be well qualified in school mathematics then you should apply for UCAS course code G100 which will give you access to everything we offer. You will have a meeting with your Adviser of Studies when you get to St Andrews, and they will help you choose which programme will suit you best.

Mathematically well-qualified entrants can embark upon one of our MMath degrees: Mathematics (G100), Pure Mathematics (G110), Applied Mathematics (G120), or Statistics (G300): G100 can include topics from Pure, Applied and Statistics.

Second year entry allows you to complete the MMath in four years by taking harder courses from the beginning of your degree, but having only a standard workload over the remaining years of study. In contrast, the Fast Track degrees offer an accelerated sequence of modules in Mathematics and/or Statistics designed in such a way as to allow some freedom of choice in first year but ensuring that the advanced topics are reached by fourth year. The course structure is unique within Scotland and maintains the flexibility of the St Andrews structure whilst still enabling completion of the MMath degree in four years.

The mathematical/statistical content of the BSc and MA degrees is the same. The difference is in the other subjects available for study alongside mathematics or statistics. An intending Mathematics and Statistics student does at least 40 credits of Mathematics in first year, and at least 60 credits in second year. Those on BSc degrees must take at least 60 more credits of science subjects (which can be Mathematics), whilst those on MA degrees must take at least 60 more credits of arts subjects (which can also be Mathematics).

Specialist modules currently on offer include:

Applied Mathematics:
- Solar Theory
- Fluid Mechanics
- Computational Techniques
- Analytic Techniques

Pure Mathematics:
- Group Theory
- Ergodic Theory
- Fractal Geometry
- Finite Fields

Statistics:
- Ecological Dynamics
- Datamining
- Bayesian Inference
- Statistical Modelling

We offer a four-year BSc/MA degree in Mathematics (G101 or G102) and Statistics (G301 or G302) for those not wishing to take the advanced MMath route. You take a broad 1000-level programme, which can include up to two other subjects, and the mathematics component concentrates upon reinforcing basic skills and ideas before embarking upon the study of Pure Mathematics, Applied Mathematics and/or Statistics in second year. The BSc is also available with second year entry.

The 2000-level modules include a central core of material that everyone takes as part of their programme with a wide range of options. These provide the foundation for study in years three and four where there are over sixty modules available for study over the two Honours years, of which Single Honours students take roughly five compulsory and twelve “free choice” modules (depending on the degree programme), and Joint Honours students half of those.

First two years of Mathematics or Statistics
At 1000-level you will study between two and four Mathematics modules, and between two and four modules in any other subject. MT1002 Mathematics is our core compulsory module, and can be studied in either semester. Students with a strong background will take this in Semester 1, whilst those who prefer a gentler route will take MT1001 Introductory Mathematics in Semester 1 and MT1002 in Semester 2. We offer three further optional Level 1 Mathematics modules.

2000-level will be your first year if you choose second year entry. We offer eight modules across the whole range of mathematics, of which you will take between four and eight, depending on whether you want to study another subject alongside Mathematics. These 2000-level modules are designed to introduce you to the study of more advanced mathematics, opening up access to the diverse range of modules that we offer in higher levels.

Students on the Fast Track route will take a mixture of 1000- and 2000-level modules in their first year, and a mixture of 2000- and 3000-level modules in their second year, enabling completion of the MMath degree in four years.

Study abroad
The School has a dedicated Study Abroad adviser and in their Junior Honours year, all BSc/MA students and non-Fast Track students on the MMath programme have the opportunity to apply to the University’s St Andrews Abroad programme. For further information, see page 52.
Class sizes and teaching delivery

**First Year:** lectures 100 - 250, labs 25 - 35, tutorials 5 - 10  
**Second Year:** lectures 40 - 110, labs 25 - 35, tutorials 8 - 15  
**Honours:** lectures 5 - 100, tutorials 1 - 20

In the first two years activities for each module centre on a daily lecture (five per week). Small group tutorials take place once a week for each module where you prepare solutions to exercises on that week’s topics, which are marked by your tutor and then discussed in class. In addition, computer labs are held once a week for each module, to assist with both IT and problem-solving skills. You will develop increasing independence and initiative as you progress through your degree programme so that by third and fourth year the average teaching load drops to around ten hours of lectures and four of tutorials per week, supplemented by private study.

In addition, in fourth year you carry out an extensive Senior Honours Dissertation on a topic of your choice, for which you will receive individual supervision throughout the year from your chosen staff member.

Successful third year students also have the opportunity to undertake summer project work as Vacation Scholars supervised by staff of their choice. This enables them to establish a close working relationship with members of a research group and gain an appreciation of research work and what it entails.

Assessment

At 1000- and 2000-level all our modules include at least 50% written examinations, with the balance of assessment being made up of coursework. At Honours level the majority of our modules are assessed solely by written examinations.

Scholarships

A number of needs-based Entrant Scholarships are awarded each year by the University to students studying Mathematics and/or Statistics. For further information please see:  
www.st-andrews.ac.uk/scholarships

Careers

The demand for mathematically able graduates exceeds the supply and the career prospects are excellent. Graduates in Mathematics, Statistics or a Joint Degree involving these subjects have a wide selection of opportunities. Around 30% of graduates go on to pursue postgraduate qualifications, either in the UK or abroad, and develop research careers. A small number enter the teaching profession, for which there are various financial incentives. A similar number embark upon Teaching English as a Foreign Language in Japan or China: an opportunity to see the world and experience a different culture in an organised and structured way. Although this may seem an unlikely move for a mathematical scientist it provides a commercially valuable insight into an economically vibrant part of the world.

Of the rest, over 50% of our graduates gain employment with merchant banks, insurance companies, computer consultancies, the civil service, industry, and financial services organisations (e.g. Goldman Sachs, KPMG, PricewaterhouseCoopers, and many more). Clear logical thinking, deductive reasoning, confidence in data handling, and IT skills are attributes that are highly prized by employers.

Graduate recruiters seek numerate, literate, enthusiastic and successful graduates. A degree in Mathematics or Statistics offers the chance to develop such a profile and, of course, a good Mathematics/Statistics degree is recognised as a substantial achievement in a demanding discipline. For more information: http://bit.ly/sta-maths-careers

See also page 42 for details of the University’s Careers Centre.