THE UNIVERSITY of EDINBURGH
School of Mathematics

Mathematics as an Outside Subject

Mathematics at university is both broader and deeper than the subject you have studied at school.

Our pre-Honours core Mathematics courses continue familiar subjects like calculus and vectors, but studying these in more depth and encountering gradually introducing new concepts. The emphasis will be much more on why things are true; you will learn how to present rigorous, logical arguments. Alongside this core we offer courses that introduce key ideas in data science and statistics, and other courses which introduce calculus at a more foundational level.

Year 1

Introductory Mathematics with Applications (Semester 1, 20 credits)

This course is intended for students who wish to consolidate and improve their understanding of mathematics by studying core mathematical topics in more depth but who are not studying on a Mathematics or highly quantitative STEM degree programme. The course is centred around introducing elementary functions and graphs, elementary algebra, solving equations, the concepts of sequences and series. At the end of the course calculus concepts will also be discussed and introduced.

Entry requirements: Not appropriate for those with SQA Advanced Higher Mathematics at Grade B, or GCE A-Level Mathematics at Grade A, or equivalent. This course is not permitted for students on Mathematics degrees.

Fundamentals of Algebra and Calculus (Semester 1, 20 credits)

This course is intended for new students who will be studying the first-year mathematics courses as part of their programmes. On the course you will study modules dealing with foundational calculus (particularly integration) and algebra (with topics such as complex numbers and more advanced use of vectors). Overall the course develops a range of topics that incoming undergraduates may not have previously studied, or may benefit from studying in more depth.

Entry requirements: Higher Mathematics or A-level Mathematics at Grade A, or equivalent.

Not appropriate for those with A-Level Mathematics at Grade A*, or SQA Advanced Higher at Grade A, or equivalent.

Introduction to Data Science (Semester 1, 20 credits)

This is an introductory level course on data science and statistical thinking. Students will learn to explore, visualize, and analyse data to investigate patterns, model outcomes, and make predictions, and do so in a way that is reproducible and shareable. During the course you will gain experience in data collection, wrangling, and visualization, exploratory data analysis, predictive modelling, and effective communication of results while working on problems and case studies inspired by and based on real-world questions. The course will focus on the R statistical computing language. No statistical or computing background is necessary.

Year 1 Core Mathematics courses

Introduction to Linear Algebra (Semester 1, 20 credits)

This course builds on the topics of vectors, systems of linear equations, matrices, eigenvalues and eigenvectors and orthogonality. The important notions of linear independence, span and bases are introduced and explained.

Calculus and its Applications (Semester 2, 20 credits)

Calculus is the most fundamental tool in mathematics and its applications. This course covers functions, limits, differentiation, integration, applications of calculus, Taylor series, and a first introduction to differential equations.

Proofs and Problem Solving (Semester 2, 20 credits)

This course is designed to introduce and develop the fundamental skills needed in Pure Mathematics. The precise language of professional mathematicians is introduced and the skills needed to read, interpret and use it. This is done in the context of learning about properties of sets, functions, and number systems.

Entry requirements for core Mathematics courses:

Higher Mathematics at Grade A (and preferably a good grade in Advanced Higher Mathematics)

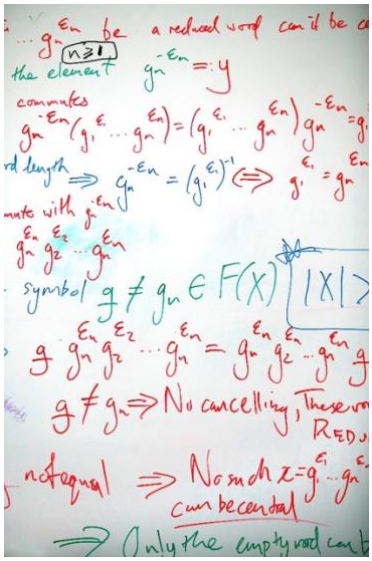
A-Level at Grade A (Grade A* and/or a good grade in Further Mathematics is an advantage)

IB HL Mathematics at grade 6 Other equivalent qualifications

How will I be taught?

Lectures

There won't be any on campus lectures this year. All courses will post pre-recorded videos and some courses will also have live online lectures which will be recorded.



Tutorials

Most tutorials will take place online using Zoom or Teams and collaborative whiteboards. Depending on social distancing rules, for some courses there may also be on campus workshops at Appleton Tower.

"I loved the fact that we built friendships with our lecturers and tutors. There was always someone to help you!"

Studying

You should expect to spend about 12 hours a week working on our 20-credit courses. You can interact with other students and tutors using software such as Piazza and Perusall and most courses will also have weekly Q&A sessions or online office hours. All lecturers and tutors are always happy to answer your questions and help you with your studies. We also run online drop-in help sessions called Mathsbase covering all our Year 1 courses.

Assessment

Your courses will have some assessed coursework and may also have a final online exam. In first and second year we have mainly 'open book' exams where you can use a textbook and your notes. This is because we want you to concentrate on understanding and using the ideas and concepts involved instead of just memorising procedures that you could look up.

Contact us:

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If you require this document in an alternative format, such as large print or a coloured background, please contact the Mathematics Teaching Organisation (MTO) by emailing mto@ed.ac.uk.