

BEING A 'MATHMO' AT CAMBRIDGE UNIVERSITY

A GUIDE FOR MIT STUDENTS

Maths at Cambridge

The Mathematics program at Cambridge University is split into three parts: IA, IB, and II. The first two parts of the program offer a wide range of courses in mathematics, from Numbers and Sets to Quantum Mechanics. The prerequisites for each subsequent year are classes from the previous year. As an MIT student going to Cambridge, you may not have all the prerequisite knowledge for a given part as the two systems are not a perfect match, so a small bit of preliminary work may be required on your part.

Classes are offered during each of the three terms at Cambridge. Generally students take four to five classes each of the first two terms and zero to two during the last term. The university offers about five to nine classes during each term. Students work out their schedule with their Director of Studies (DoS) and Prof. Miller at MIT prior to each term.

There is a cumulative exam, known as the Tripos, towards the end of the last term. Mathematics exams are offered for each of the three parts. Each part has four papers, usually taken in four consecutive days, with different subject materials being tested on all or some of the papers. Students are only expected to attempt questions in courses they have taken and prepared for.

The Tripos exam is the major component in determining each student's class (basically a grade for the year), ranging from a first (highest) to a third (lowest passing mark). The other component taken into account is the CATAM projects. These are computational problems, such as differential equation analysis and matrix manipulation, that are solved by writing computer programs. Students may submit up to four projects, two for each of the first two terms. Each project carries the same weight as one question on the Tripos exam.

Prepping to Become a Mathmo

Most MIT students spending their junior year at Cambridge will fit right into the IB program, although some may be ready for Part II. It is recommended to have taken 18.03, 18.100B, probability, and some linear algebra to be prepared for IB material. Do not worry if you have forgotten some of this stuff because lecturers will briefly go over important concepts before delving into new material. You can also get extra supervisions to review IA mathematics Cambridge students have already been exposed to if you ask for them.

All the work you do during the term, through example sheets and supervisions, is designed to help you prepare for the Tripos exam at the end of the year. It would be in your best interest to spread the studying throughout the year as opposed to saving it for the end. This is much easier said than done. But given that the exam covers the entire year, it is not advisable to start studying the night or even the week before. Also, try to complete the CATAM projects. The marks you earn from CATAM will help you fulfill one CI-M requirement for MIT as well giving you extra points towards the total grade for the year. It

might be helpful to know some programming (like basic commands and syntax) before going to Cambridge. Most students program in C, but others have used Mathematica or Java.

Below are specific topics that may be helpful to know prior to studying at Cambridge for some of classes offered in the IB program:

- Analysis II – Experience with proofs and content of 18.100B
- Linear Algebra – Basic knowledge about vector spaces and matrices
- Methods – Be comfortable with Kronecker Delta and Epsilon notation; solving elementary differential equations is essential.
- Markov Chains – Basic probability
- Quantum Mechanics – Differential equations; vector calculus
- Groups, Rings, and Modules – Basic group and set theory; Orbit-Stabilizer Theorem, Lagrange Theorem

While the aforementioned comments are designed to help prepare you for your transition into a Cambridge education, there will always be other obstacles that will present themselves. Seeking help and aid from supervisors and other students will hopefully help ease any temporary discomfort you may feel.

For more general information about CME, please peruse through the guide book found at the following link: http://mit.edu/cmi/ue/CME_guide_book_finalv.pdf

The Cambridge University Mathematics departments can be found at:
<http://www.damtp.cam.ac.uk/>
<http://www.dpmms.cam.ac.uk/>

Courses are listed on: <http://www.admin.cam.ac.uk/reporter/2004-05/special/>

Useful contacts

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