

Jesus College, Oxford

Subject Notes: MATHEMATICS



Academic Staff

The teaching provision at Jesus College is generous in relation to the number of Mathematics students. The college has tutors in all the main branches of Mathematics, who are committed to mathematical research as well as to teaching, and who together cover a wide range of subjects:

Fellows

Professor Andrew Dancer's research is in differential geometry, especially the study of Einstein spaces. He is responsible for the teaching of pure mathematics including algebra, analysis, geometry and topology.

Dr James Oliver's research is predominantly in fluid dynamics and its applications to free and moving boundary problems in industry, engineering and biology. He teaches Physical Applied Mathematics.

Professor Robin Evans teaches probability and statistics for the College. His research interests include statistical causality, graphical models and algebraic statistics.

About the Course

Teaching in Mathematics, as in most other subjects, has two components: University lectures, and college tutorials or classes.

The 'Studying Mathematics at Oxford' brochure contains information about the course content and can be found at: <https://www.maths.ox.ac.uk/system/files/attachments/introbook20.pdf>

As for the College side; in the First Year the syllabus is compulsory, and all Mathematics students follow the same course. The lectures, which are interrelated, are intended to cover the syllabus completely. In tutorials and college classes, you discuss with your tutor what you have learnt from lectures, and work through your solutions to problems designed to test your understanding. Problems are set by the lecturers in the first year, though in some subjects your tutor may set different ones instead. Your tutor is also likely to suggest some reading to do, and this reading may also be discussed in the tutorials. (The college operates a generous book grant scheme, which subsidizes the purchase of necessary textbooks by undergraduates.) Tutorials are 'pupil-centred' teaching in which the student determines the subject matter; their usefulness depends entirely on how thoroughly the student has prepared for them.

At the end of the summer term of the first year, University examinations are held. It is necessary to spend some time revising for these, and lectures therefore finish halfway through the term; college teaching continues in the form of revision classes and tutorials. College Scholarships and Exhibitions may be awarded at the end of the first year to students who have worked well; the results of first-year exams play a major role in decisions on these awards.

In the second year the syllabus contains compulsory courses in algebra and analysis that are taken in the autumn term. Teaching is likely to involve a combination of tutorial and larger classes. Optional courses are also available and for these the teaching arrangements can be more varied; a student might have a single weekly tutorial to cover two or three related options, or those taking a particular option might be taught together in a class, or there might be some intermediate arrangement combining classes with

shared tutorials. The college tutors between them cover nearly all the available options, but for one or two options teaching might be arranged with a specialist in another college. The tutors will set written work and reading on an individual basis. Second-year lectures aim more at providing a framework than a comprehensive treatment, and so the importance of reading and learning from your own study is greater than in the first year. Examinations at the end of the second year count towards the final degree mark. There are two papers on the compulsory core subjects and two cross-sectional papers on the selected topics.

In the third year (and fourth year) of the course, the syllabus provides a very wide range of options at a more advanced level. Each student will select only a few of these options. Teaching is usually by means of intercollegiate classes that run in parallel with the lectures. These classes are normally conducted by a faculty member and a graduate assistant; written work is set and marked each week and then discussed in the class. Although this teaching does not take place in college, the college tutors carefully monitor each student's progress and are always available if any difficulties arise. Each student is assigned to one tutor who acts as 'in-college supervisor', and who will stay in touch with the student even though he may not be directly involved in the student's teaching.

If you have a mathematical interest that is not catered for by the syllabus, there are several ways in which you may pursue it. Students may choose to enter the competition for the College Mathematics Essay Prize or the Vaughan Prize (awarded for outstanding work in Mathematics.) This involves writing an essay on a mathematical subject of your own choosing: essays of high enough quality can win substantial prizes of over £100. There is no restriction on the number of students who may be awarded prizes in any one year. It is also possible, with your tutor's support, to take a subject of your own choosing as part of the final exam; such a proposal needs to be approved by the faculty board.

At the end of the course come the final examinations, on which your degree result depends. College tutors conduct revision classes and tutorials to prepare for these exams in the spring and summer terms. Whatever you do after graduating, we hope that you will remember your time at Jesus as one when you enjoyed the intricate and beautiful challenges of Mathematics.

Joint Schools

The following undergraduate courses are available at Jesus College:

- Mathematics and Philosophy
- Mathematics and Statistics
- Mathematics and Computer Science

Admissions

In a total College entry of about 100 undergraduates, 8 are offered places in a typical year to read Mathematics and the related Joint Schools courses. Candidates are selected on the basis of academic record (e.g. GCSEs) and potential, as shown by their UCAS reference, performance in the written test, and in interviews if shortlisted.

Academic requirements: Offers made to candidates will be conditional upon A-level results or equivalent qualifications. The standard offers for students taking three (or more) A2 levels are:

- A*A*A including A* in A2 Mathematics and A* in A2 Further Mathematics
- OR A*AA including A* in A2 Mathematics **PLUS** A in AS Further Mathematics
- OR A*AA including A* in A2 Mathematics (if Further Mathematics is not taken)

We strongly recommend that candidates study Mathematics and Further Mathematics to A2 level if it is possible for them to do so. We will accept a candidate taking only one Mathematics full A2 level if we think that he or she is a good enough mathematician to cope satisfactorily with the heavy workload in the first year; such a candidate would need to do quite a bit of extra reading before coming up to Oxford in order to be prepared for the course.

We have no preference as regards other subjects taken with Mathematics and Further Mathematics. Sciences are the most common, and a Physics A2/AS level might provide some helpful background; but it is by no means essential to have a science A2 or AS level.

Written test: All candidates must take the **Mathematics Admissions Test (MAT)** on **4 November 2020**. This will take place in schools or approved test centres for non-UK candidates. The registration for the MAT is through Cambridge Assessment Admissions Testing and the deadline for this is **15 October 2020**. Further information about how to register for the MAT can be found at: <http://www.ox.ac.uk/admissions/undergraduate/applying-to-oxford/tests/mat>

Written work: Candidates are **not** required to submit written work as part of the admissions process.

Interviews: If you are interviewed at Jesus you can expect two or three separate interviews with different tutors. The interviews will involve some general questions, but most of the time will be spent discussing mathematical topics.

Deferred Entry: Applications for deferred entry to Jesus College are possible, but generally not encouraged unless it is planned to spend at least part of the year out doing something with a high level of mathematical content. You must apply for deferred entry at the time of application to Oxford: you cannot change your mind after an offer has been made. Please refer to departmental web sites for subject-specific advice. You should be aware that applicants who are offered places for deferred entry will generally be among the strongest of the cohort for their subject. We would not usually offer more than one deferred place per subject in order not to disadvantage the following year's candidates. In some cases, an applicant for deferred entry may be offered a place for non-deferred entry instead. If you require any further advice, please contact: admissions.officer@jesus.ox.ac.uk

Postgraduate Studies and Careers

The Mathematical Institute at Oxford enjoys a high reputation, both nationally and internationally, for the excellence of its teaching and research, and is among the largest in the country. Mathematical research at Oxford covers a very wide range in both pure and applied mathematics. It attracts generous research funding and draws students and visiting faculty from all parts of the world. The following degrees are available at postgraduate level:

- DPhil or MSc by Research in Mathematics
- MSc Mathematical and Computational Finance [*Jesus College does not normally accept students for this course*]
- MSc Mathematical and Theoretical Physics
- MSc Mathematical Finance [*Jesus College does not normally accept students for this course*]
- MSc Mathematical Modelling and Scientific Computing
- MSc Mathematical Sciences
- MSc Mathematics and the Foundations of Computer Science

The Department of Statistics is responsible for teaching you Probability and Statistics courses, and has teaching and research strengths in a wide range of modern and exciting areas of statistical science. The following postgraduate degrees are offered:

- DPhil or MSc by Research in Statistics (including the StatML CDT)
- MSc or PGDip Statistical Science

Our graduates are prepared for a diverse range of careers. Recent information shows figures for first destinations of graduates as: further study 28.3%; industry and IT 11.5%; accountancy 15.0%; finance 15.0%; others 25.8%; still seeking 4.4%. At the end of the first year, it may in principle be possible to change to another degree course within the Mathematical, Physical and Life Sciences Division, subject to the availability of space on the course and to the consent of the college. In the later stages of honour schools in Mathematical and Physical Science, there are opportunities to take options in other subject areas.

Preliminary Reading and Further Information

Further information about Mathematics at Oxford can be found at: www.maths.ox.ac.uk

Information about Admissions is available at: <http://www.ox.ac.uk/admissions/undergraduate/courses-listing/mathematics>

Contact details

If you have any questions about our entrance requirements, or about applying to study at Jesus College, please contact the Admissions Officer:

Tel: 01865 279721
Email: admissions.officer@jesus.ox.ac.uk
Web: www.jesus.ox.ac.uk/study-here

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