Jesus College, Oxford

Subject Notes: ENGINEERING SCIENCE

Academic Staff

Fellows

**Prof. Stephen Morris** is the Ana Leaf Foundation Fellow and Tutor in Engineering Science who teaches subjects in the Mathematics and Electrical Engineering papers in the College. He is also an Associate Professor in the Department of Engineering Science, where he currently lectures 4th year courses on Applied Optics and Solar and Photovoltaic technology. He also organises a 2nd year laboratory on Electrical Machines and a 3rd year project to design an advanced photonics platform. His research interests involve the development of new opto-electronic devices based upon polymers and liquid crystal materials. This includes thin-film lasers, displays and related devices, optical phase modulators and solar cell technology.

**Prof. Ben Williams** is a Fellow and Tutor in Engineering Science who teaches subjects in the Mathematics and the Energy papers in the College, including Fluid Mechanics, Thermodynamics, Heat & Mass Transfer and Electrical Machines. He is also an Associate Professor in the Department of Engineering Science where he lectures on the 1st year Thermodynamics and 2nd year Energy Systems courses, and organises the 1st year Thermodynamics lab. His research speciality is developing and applying non-intrusive optical diagnostics to thermofluid systems, including IC engines, gas turbines and hypersonics.

**Dr Suchandrima Das** is a Career Development Fellow in Engineering Science who teaches subjects in the Mathematics and Structures, Materials, and Mechanics papers in the College. She is also a Departmental Lecturer in the Department of Engineering Science. She has an interdisciplinary background and studied electrical engineering, biomedical engineering and solid mechanics in her bachelor, masters and DPhil programs, respectively. Her current research combines these three fields under the realm of material engineering by focussing on the design and characterisation of novel materials for high-performance applications such as medical implants, nuclear reactor components, high-frequency transistors etc. This involves combination of ab-initio calculations with multi-scale computational modelling and multi-technique experiments, such as micro-mechanical tests, synchrotron X-ray diffraction and electron microscopy.

Lecturer

**Dr Brian Tang** is a Lecturer in Engineering Science who teaches subjects in the Structures, Materials and Dynamics and the Engineering in Society papers in the College. He is also a Post-Doctoral Research Associate in the Department of Engineering Science. His current research focuses on the development of novel fluidic devices, including plasma-actuated, no-moving-parts valves for integration into the secondary air systems of large civil aviation jet engines and ultrasonically activated fluidic switches used for external aerodynamic flow control.

About the Course

The Engineering course at Oxford is of four years’ duration. The first and second years give a broad base in Mathematics and some of the main branches of Engineering Science, namely Mechanical, Electrical, Information, Control and Civil Engineering, as well as Materials and Energy Systems. In the third year, the Engineering Science degree separates in to Biomedical, Chemical, Civil, Control, Electrical, Information Materials, and Mechanical options. There is also the possibility of selecting the Engineering, Entrepreneurship, and Management course. The fourth year of the course is entirely specialised and you have a wide choice of subjects from which to choose.
Practical work in the first two years consists of a mixture of set experiments, designed to develop practical techniques and to illustrate key aspects of the lecture courses. It also includes open-ended “design-build-test” projects, giving you more freedom to explore the nature of Engineering. The second year culminates with a series of “coursework modules” where you choose from a wide range of subjects and explore them in detail for a whole week at a time. In the third year of the course, you undertake a group design project, co-operating in a group of 4-6 students to look at all aspects of a realistic Engineering design project. As an example, Prof Morris runs a 3rd year project that involves the design of an imaging and manufacturing system that could be used to fabricate nanotechnology with light and Dr Das participates in the 3rd year project that is in collaboration with CERN. In the final year, you will have an even more demanding, but deeply interesting, individual research project. This is an important component of the 4-year course as it counts for 50% of the final year.

Compared with most Engineering courses in the country, you will find that the number of timetabled lectures is rather small. Do not be deceived by this! A key feature of Oxford education is the demand on the students to prepare work by themselves in their own time. You are aided in this task by College tutorials, which run in the first two years of the course. These are normally held at least twice a week in small groups of two or three students, or even one student at a time when this is appropriate. Tutorials have three main roles. The obvious one is to check that you are tackling the problem sheets handed out by lecturers in the Department, but if you experience difficulties the tutorials can act as specific remedial sessions.

The tutorials also act as a stimulant to encourage you to think more widely about your subject. Most of your tutorials will be taken by one of the Engineering tutors at Jesus College, but they may also be supplemented by experts from outside the College when necessary. In the third and fourth years of the course, when the subjects become more specialised, the Department organises problems classes in place of College tutorials.

There are University examinations at the end of each year. In addition, colleges maintain a more even pressure by setting their own examinations called Collections. Be assured that success in Engineering comes from a steady and sustained effort throughout the course: last minute cramming can never substitute for this!

Admissions

Of the 100 or so undergraduates admitted to Jesus College each year, about six will be reading Engineering Science. Candidates must take Physics and Mathematics at A Level (or an equivalent qualification such as the International Baccalaureate). At Jesus College we do not mind what the third subject is (or in the case of some A Level candidates, the fourth subject). We are always pleased to see candidates with a broad range of interests, although a second Mathematics subject is the most directly relevant to the course. If candidates have a choice, applied maths (Mechanics) modules are particularly recommended. Please contact us if you have any queries about the subjects you are taking. Whatever these subjects are, it is important that you achieve a high standard.

Academic requirements: Offers made to candidates will be conditional upon A-level results (A*A*A to include Mathematics and Physics. The A*s must be obtained in Mathematics, Physics or Further Mathematics, if taken) or equivalent qualifications.

Written test: Candidates for all Engineering courses must sit the Physics Aptitude Test (PAT) in schools on 4 November 2020. Candidates are required to register with Cambridge Assessment Admissions Testing (http://www.admissionstestingservice.org/) which sets up and administers the test. The closing date for test registration will be 15 October 2020. Further details can be found at: http://www.ox.ac.uk/admissions/undergraduate/applying-to-oxford/tests/pat

Written work: No written work from school or college need be submitted prior to interview.

Interviews: Interviews will be held at the College in mid-December. You will have one interview with the Engineering tutors at Jesus College and another on the same day at another college chosen automatically for you. The interview at Jesus is quite informal, the purpose being to assess your ability to succeed on our courses and your motivation to do so. We will expect you to understand the particular nature of our courses
at Oxford and we will question you on both mathematics and physics topics that you have studied. We will guide you to reveal your creative, scientific or engineering interests.

**Deferred Entry:** Applications for deferred entry to Jesus College are accepted. However, 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 websites 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 the Admissions Officer via admissions.officer@jesus.ox.ac.uk.

**Frequently Asked Questions**

- **What A Levels do I need?**
  
  To read Engineering you normally need Maths and Physics (with an A* in either one or both of these) and a third A Level at grade A (or A*). The most relevant third (or fourth) A Level is a second Maths course, and the most popular is Chemistry, but other subjects are equally welcome.

- **Does it make any difference if I apply for straight Engineering Science or one of the branches of Engineering?**
  
  At Jesus College we consider all Engineering applications together and make a fixed total number of offers. The first two years are common to all courses and you are free to choose the options you would prefer in the third and fourth years.

- **What about sponsorship?**
  
  We are always pleased for candidates to apply for industrial sponsorship, or to consider requests to take a year out between school and university for any other sound reason. However, a consequence of our operating with a small quota is that we must know the year for which you are applying at the time of the interview. This poses very little problem in practice, because we find that candidates who are offered a place at Jesus College nearly always obtain some sponsorship if they try, and if you do not obtain sponsorship at the first attempt we may be able to help with further suggestions.

**Postgraduate Studies and Careers**

The study of all branches of Engineering in Oxford is encompassed in a single, unitary Department of Engineering Science. The opportunities in the Department for postgraduate study and research include the conventional disciplines of Engineering such as Chemical, Civil, Control, Electrical, Materials and Mechanical, as well as Information Engineering and Biomedical Engineering.

The combination of rigour and practicality in their training makes our Engineering graduates attractive to a wide range of employers in Engineering, commerce and other areas. The Engineering undergraduate course is also accredited by the relevant professional bodies such as the Institution of Engineering and Technology (IET).

**Further Information**

Full details of the Engineering courses at Oxford can be obtained from the departmental prospectus and you are advised to obtain a copy from the Department at: [www.eng.ox.ac.uk](http://www.eng.ox.ac.uk).

Information about Engineering Admissions is available at: [http://www.ox.ac.uk/admissions/undergraduate/courses-listing/engineering-science](http://www.ox.ac.uk/admissions/undergraduate/courses-listing/engineering-science)
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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