

# Engineering



## A-LEVELS REQUIRED

Mathematics and Physics. Further Mathematics is recommended but not compulsory.

## MINIMUM A-LEVEL GRADE REQUIREMENTS

A\*A\*A including Mathematics and Physics

## ADMISSIONS TEST

### Physics Aptitude Test (PAT)

A 2 hour paper with questions on Mathematics and Physics. The syllabus can be found on the Oxford Physics Department Website [www.physics.ox.ac.uk](http://www.physics.ox.ac.uk).

**Main topics for Maths:** Elementary Mathematics, Calculus and Elementary Physics

**Main topics for Physics:** Mechanics, Waves, Optics, Electricity and Magnetism, the Natural World, the use of mathematics in a physical context and problem solving.

## COURSE DESCRIPTION

A four-year course, leading to the degree of Master of Engineering. The first two years are devoted to general topics which are useful for all disciplines of Engineering. In the third and fourth years there is scope for specialisation into one of six branches of engineering: Biomedical, Chemical, Civil, Electrical, Information and Mechanical.

## STRUCTURE OF MODULES

### 1st year

- 4 Core Engineering Papers in Mathematics, Electronic and Information Engineering, Structure & Mechanics and Energy
- Engineering Practicals

### 2nd year

- 4 Core Engineering Papers in the same 1st Year modules
- Engineering Practicals

### 3rd year

- Engineering Computation
- Engineering in Society
- Engineering Intermediate Options
- Engineering Design Project

### 4th year

- Engineering Specialist Options
- Major Project

## APPROXIMATE NO. OF CONTACT HOURS PER WEEK

**Tutorials:** 2 - 4 hours

**Lectures:** 8 x 1 hour lectures

**Labs:** 1 x 5 hour session

## TUTORIAL TESTIMONIAL

Tutorials are 1-2 hour lessons with a college tutor where you go over the content of a lecture course and work through the associated problem sheets (8-10 questions) that you have prepared before the tutorial. The purpose of the tutorial is to go through the sheet and discuss any questions you have about the topic. These can be either be one-on-one sessions with the tutor or with classes of up to 3 pupils. As a result, you can get more tailored advice and support from the tutor and have engaged group discussions about the work.

## LABS TESTIMONIAL

1st year Engineering students have a 5 hour lab session every week specialising in different fields such as electrical engineering, computer aided design, mechanical engineering and computing. In each lab course, you learn how to use equipment and software so that you can create your own project by the end of the year. For example in Electrical Engineering, first year students build a radio using the skills developed in the lab sessions and science taught in lectures. In 2nd year, the labs are also 5 hours long but less frequent.

## WHY ENGINEERING?

Consider engineering if you feel competent in Maths and you are interested in understanding the real-life applications of Maths and Physics principles.

Oxford is one of the few universities which offers the general engineering course. It is beneficial to gain a multidisciplinary understanding of engineering with elements from all fields of the subject. A good choice for students who are unsure which engineering discipline they want to go into.

## CAREER PROSPECTS

An engineering degree will provide you with many skills and open a range of career options beyond the obvious engineering routes. It can also provide a solid foundation for working in data analysis, consultancy, banking, finance, entrepreneurship and more. Those interested in engineering-based research can choose to do a PhD which requires a 1st or high 2:1.

## PERSONAL STATEMENT TIPS

- Start by writing a bullet point list of everything you would like to include e.g. Your strengths, interests, aspirations etc. Then structure your points into paragraphs and develop your first draft of the Statement, ignoring the character limit. Then draft and re-draft again and again until you are satisfied with it.
- When bringing up experiences or research linked to engineering, be sure to mention the things you learnt or took away from them. It is no good listing everything you've done if you don't mention how it developed you.
- Make it clear to the readers WHY you want to apply for engineering. If you read a book or complete work experience, discuss what you learnt from it and why it has made you interested in engineering.
- Ask lots of people to read your Statement and take on their advice so that it is as clear and engaging as possible.

## INTERVIEW TIPS

- Don't be afraid to ask questions. Making an error or going down the wrong route isn't necessarily a bad thing. Your interviewer will give you a clue to bring you on the right track and if you can use that hint to get to the right answer, it actually works in your favour.
- Think out loud – discuss all of your thoughts with the interviewers so that they can see that you are contemplating the problem/task.
- The interviews are essentially 'mock tutorials' so try to have open discussions with the tutors.
- Actively write things down in the tutorial. You'll inevitably be nervous and so trying to think of everything in your head plays very well into confusion so keeping everything written out in front of you ensures that you keep things structured.
- Remember to smile! The people who interview you are also the same people who could go on to tutor you so they'll also be looking to see if you respond well to their way of teaching and being a pleasant person to teach always helps!

## PAT TIPS

- Treat it as any other exam. There isn't anything special that you need to do for this exam that you wouldn't do for any other exam so don't stress if you feel like there's something 'missing' in your revision because there isn't!
- Go through the syllabus provided on the Oxford Physics department's website. They list everything that can come up in the exam and so it is a very good way to tailor your revision.
- Do as many past papers as possible and practice in timed conditions. One of the hardest things about the PAT is actually finishing the paper and so getting used to how quickly you'll need to work is really important.
- Draw diagrams and graphs wherever possible, even if it is very trivial. Very often, marks can be awarded for drawing the graph of an equation but they're easily overlooked.

## ONE THING I WISH I KNEW WHEN I WAS APPLYING

The college tutors are very open and helpful – they are always there to answer your questions. They aren't as intimidating as Oxford tutors are often portrayed.

# Recommended reading/viewing

### Books

- **Professor Povey's Perplexing Problems** – Thomas Povey
- **Engineering: A Very Short Introduction** – David Blockley
- **Stuff Matters** – Mark Miodownik
- **The New Science of Strong Materials** – JE Gordon
- **Flying Buttresses, Entropy and O-Rings** – James L. Adams

### Videos, podcasts and other content

- **Twenty Days - Amy Johnson** (audio diaries you can find on the BBC detailing her solo flight to Australia)
- **The Engineering Student Experience** (podcast)
- For a taster of PAT, interview and tutorial-style questions, visit:
  - <http://i-want-to-study-engineering.org/>
  - <https://www.bpho.org.uk/>
  - <https://isaacphysics.org/>
- Visit the following websites for engineering and technology news, keeping on top of developments in the engineering sector may be useful, particularly for the interviews: **New Scientist, Interesting Engineering & The Engineer**