



The Oxbridge Admissions Test & Interview Guide

A handbook for prospective Physics, Physical Natural Sciences, Materials Science and Engineering Students

for Autumn 2020

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A Note from Us

The Oxbridge Admissions process can be hectic and stressful. This handbook, written by our tutors, aims to provide a comprehensive overview of the whole process. The handbook covers preparation tips, exam & interview technique, and provides recommendations for further resources to push yourself beyond the A-level syllabus.

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Introduction

In this section we outline the format of the PAT, NSAA and ENGAA. If you are applying to certain courses at Oxford or Cambridge, you will have to take one of these tests as part of your application.

The Physics Aptitude Test (PAT) for Oxford University:

General Information	
Test Date	4 th November 2020
Test Venue	Either at your school or at an official test centre
Price	Free (though independent test centres may charge a small administration fee)
Registration Opening Date	1 st September 2020
Registration Closing Date	15 th October 2020 at 18:00 (BST)
Use of a Calculator	Permitted (Link to Calculator Spec at bottom of section)

Background

The PAT is taken if you are applying for Physics, Engineering Science or Materials Science at the University of Oxford. It is marked out of 100 and the exam lasts 2 hours. The aim is to test your existing knowledge of A-level Maths and Physics in a more unfamiliar and challenging context. Hence, the PAT syllabus (linked at the bottom) follows your A-level maths and physics courses. It is worth making sure that you are comfortable with everything on the syllabus. If not, we are happy to help!

There are normally between 10-12 multiple choice questions (MCQs) followed by 12 longer questions which have more weighting to them. In the past there have been separate physics and maths sections, but they have combined them from 2017 onwards as well as re-introducing MCQs.



Admissions Statistics

There is a report published on the PAT website detailing how they use the test for Physics places at Oxford.

For Physics, in 2019 there were 1828 applicants for 204 places - 8.8 applicants per place. The PAT is used to whittle the number of applicants to approximately 500. It is used along with your GCSE scores to shortlist candidates for interview. There is not, however, a hard and fast cut-off mark and roughly 100 pupils were included in the shortlist when they showed other evidence of excellence or contextual information was included.

There are no published statistics explaining the use of the PAT in Engineering or Materials Science.

Admissions Statistics (3-year average)			
Subject	Number of Applicants	Number of Places	Applicants per Place
Engineering	1005	171	5.88
Materials Science	162.5	39	4.17
Physics	1293	181	7.14

Useful Links

[Calculator Specification](#)

[PAT syllabus](#)

[Solutions & past papers](#)



The Engineering Admissions Assessment (ENGAA) for Cambridge University:

General Information	
Test Date	4 th November 2020
Test Venue	Either at your school or at an official test centre
Price	Free (though independent test centres may charge a small administration fee)
Registration Opening Date	1 st September 2020
Registration Closing Date	15 th October 2020 at 18:00 (BST)
Use of a Calculator	Not Permitted

Background

The ENGAA is taken if you are applying for Engineering at the University of Cambridge. It is marked out of 60 and the exam lasts 2 hours. The aim is to test your existing knowledge of A-level Maths and Physics in a more unfamiliar and challenging context. Hence, the ENGAA syllabus (linked at the bottom) follows your A-level maths and physics courses. It is worth making sure that you are comfortable with everything on the syllabus. If not, we are happy to help!

The format of the paper is as follows:

- **Section 1:** 20 Maths and Physics multiple choice questions followed by 20 Advanced maths and physics multiple choice questions. (60 minutes, no calculator):
- **Section 2:** 20 Advanced Physics multiple-choice questions. (60 minutes, no calculator)

Admissions Statistics

Unfortunately, there is no official information on how the scoring of the ENGAA is used; however, in 2019 there were 2092 applicants for 310 places - 6.7 applicants per place. Unofficially, the ENGAA is used as a replacement for AS levels. It used to be a reliable predictor of A-level results.



Useful Links

[ENGAA syllabus](#)

[Solutions & past papers:](#)

The Natural Sciences Admissions Assessment (NSAA) for Cambridge University:

General Information	
Test Date	4 th November 2020
Test Venue	Either at your school or at an official test centre
Price	Free (though independent test centres may charge a small administration fee)
Registration Opening Date	1 st September 2020
Registration Closing Date	15 th October 2020 at 18:00 (BST)
Use of a Calculator	Not Permitted

Background

The NSAA is taken if you are applying for Natural Sciences (colloquially known as NatSci) at the University of Cambridge. It is marked out of 60 and the duration of the exam lasts 2 hours. The aim is to test your existing knowledge of A-level Maths and Physics in a more unfamiliar and challenging context. Hence, the NSAA syllabus (linked at the bottom) follows your A-level maths and physics courses. It is worth making sure that you are comfortable with everything on the syllabus. If not, we are happy to help!

The format of the paper is as follows:

- **Section 1:** 20 Mathematics multiple-choice questions followed by 20 Physics multiple choice questions (you are given the option of Physics / Chemistry or Biology)
- **Section 2:** In this section there are 3 parts of which you must select **ONE**. The parts are again multiple-choice Physics, Chemistry or Biology (60 minutes)

(We only teach the Physics section of the NSAA)



Admissions Statistics

Unfortunately, there is no information on how the scoring of the NSAA is used; however, in 2019 there were 2708 applicants for 586 places – 4.62 applicants per place. Unofficially, the ENGAA is used as a replacement for AS levels. It used to be a reliable predictor of A-level results.

Useful Links

[NSAA syllabus](#)

[Solutions & past papers:](#)

Relevant Information for all 3 Tests

- Know your physics syllabus, and check if you need to learn any additional points
- Oxford points out that their syllabus is not exhaustive but they are not trying to catch you out with novel formulae; they want to see if you can apply your current A level knowledge under more difficult circumstances.
- There is no negative marking so if you do not know the answer to a question it is worth a guess.

Interviews for Oxford & Cambridge University:

General Information	
Interview Dates	November-December 2020
Interview Venue	Online (the universities will provide more information if you are interviewed)
Interview Duration	~30 mins per interview
Number of Interviews	2-4 Interviews
Price	Free
When you hear	Anytime in November post admissions test



Background

The interview process is one of the key determiners at being successful in your application. If you apply for any subject at either Oxford or Cambridge, you will be interviewed. The interviews are designed to test the way you think, as opposed to what you have memorised. You will be asked questions which deliberately challenge and stretch you in unfamiliar ways.

Format of Interviews

The format of the interviews you will take is dependent on both your choice of subject and college. In this guide our advice is broad, however, you should conduct more research into your particular criteria.

In general, the interviews are similar in format to a tutorial/supervision. You will usually be interviewed by one or two tutors and they will use the interview to see how teachable you are, not just how much you know. It is important to remember that the interview is a two-way discussion and that the tutors want to see how well you would engage in and benefit from tutorials/supervisions as an undergraduate.

Typically for Physics, Engineering, Materials Science and Physical Natural Sciences, there is a heavy focus on maths and physics problems as opposed to personal statement and motivational questions. The latter may be used at the start of the interview to ease you in and to allow you to demonstrate your passion for the subject, but the majority of the time will be spent testing your problem-solving ability.

At the time of writing the general information is correct, however, the universities will be continually releasing updated information on what they are doing for the interviews this year due to COVID-19. Make sure to check the links below every so often.

Useful Links

[Oxford Interview Page](#)

[Cambridge Interview Page](#)



How to Prepare

In this section we explain our tried and tested strategies for effective revision and preparation throughout the stressful Oxbridge admissions period. Please note: this is by no means an exhaustive list, but we believe if you follow these guidelines you will perform at the best of your abilities.

PAST. PAPERS. (T)* *T= Useful for Tests, I = Useful for Interviews

In the admissions test you will not be successful if you have not done past papers. The more the merrier – but ensure you do them under exam conditions and afterwards record your mistakes so you can revisit weaker topics. Given the limited number of past papers, it is important to make sure you learn as much as you can from each one.

Start Early (T, I)

By the end of the summer holidays you should be thinking about preparations for the admissions test and interview. It takes time to develop efficient exam technique and to learn how to methodically break down tricky problems.

Varied Practice is Important (T, I)

Both the admissions test and the interviews take A-level concepts and apply them to new and challenging scenarios. Practicing using a wide range of questions will teach you how to break down many different types of problem and to understand what theory needs to be applied.

Make a Plan (T, I)

Use our *Goals Visualisation Template* (downloadable from our website) to help visualise your goals and create realistic commitments to help you get there. Stick your goals visualisation on your wall so you stick to the plan and understand that change is incremental, and results will come with perseverance.



Practice the Real Thing (T, I)

Do test papers under timed, exam conditions to help refine your exam technique. Do mock interviews with teachers/Kaizen Tutors to get comfortable being uncomfortable. It is important to practice explaining your thought process. Always ask for constructive feedback so you can continuously improve your interview technique.

Be Rigorous (T, I)

Record all your mistakes in our *Past Paper Journey Template* and look for trends in errors. Revise weaker topics and make them your strengths. Be efficient with your work – 1 hour of focused revision is much better than 3 hours of revision with the football on.

Be Wary of Burnout (T, I)

Burnout is a real thing. Do not push yourself too hard too early or you will lose motivation during the crucial week before the exam and perform worse. By now you will hopefully know how much you can personally work in a day, so factor that in. If you work fewer hours in a day prepare over a longer period. Plan your work to gradually increase towards the test so that you are doing most of the work in the preceding few days, so you peak at the right time.

Lead a Balanced Life (T, I)

Oxbridge is not the be all and end all! Work hard, but continue doing your hobbies and allow yourself lots of downtime. The most successful students are always those who have commitments outside of work – so never give these up.

Thought-Provoking Questions (I)

The best preparation you can do for an Oxbridge interview are questions that are unfamiliar and more difficult than A level questions but use your existing physics and maths knowledge. These questions can be found in our resources section; they will help you to naturally start thinking more logically and flexibly than you are taught to by an A level syllabus and so are perfect preparation for interviews.



Exam Technique and Strategy

In this section we address how to correctly approach papers to maximise potential marks and deal with flustering and time pressure. You will know many already, but there is no harm in repeating them.

1. Multiple Choice Questions (MCQs)

All three assessments have some form of MCQs and so it is important to practice the technique associated with them.

- a. Time Management: Make sure you budget time to do each question – do not get fixated on one question and miss out on ones at the end. Especially when they are all equally weighted. If you cannot answer a question in your allocated time, move on.
- b. Careful Question Reading: A simple point but it is easy to skim a MCQ when you have seen a few similar ones and actually misinterpret the question. Make sure to spend some time fully understanding what the examiner wants as an answer.
- c. Eliminate wrong answers: If you are unsure and need to guess and answer spend some of your time working out which answers are definitely wrong.

2. Longer Answer Questions (PAT only)

These questions often consist of a few parts, each of increasing difficulty as you progress through the question. This means that if you complete a question fully, take confidence from it. But do not expect to be able to complete every part of every question. Remember that the later parts of these questions often use answers from earlier parts. If you get stuck, look for ways to use earlier answers in your working. The BPhO past papers, outlined further in the Resources section, also contain longer answer questions which are useful practice.



3. Flustering

Do not fear not knowing, do not be thrown off your game by questions you cannot solve, even if they look deceptively easy. If you are applying and have a reasonable chance of getting in, you will be used to doing very well in A-level papers. You do not need 90% in these exams to get into Oxbridge.

4. Create a Crib Sheet

The night before the exam, write up a “cheat sheet” (1 side A4) of useful formulae and tricks you need to remember. You can use the Past Paper Journey Templates to find common errors you have made in the past. Before going into the exam, look over this and then throw it in the bin on your way in. Short-term memory is very powerful!

5. Laying Out Working

Just because most questions are MCQ, do not skimp on rigorous working, especially on the tougher questions. Most importantly, remember that less haste = more speed. Take the extra second to write out another line of working, always draw a diagram, and you will score much more highly than if you rush through questions just to finish in time.



Interview Technique and Strategy

In this section we address how to correctly approach the interview to demonstrate the best version of yourself.

1. Verbalise Your Thoughts

The most important thing is to talk through your thought process out loud. Interviewers are far more interested in the process rather than the result. Make sure you engage with your tutor and do not be afraid to ask them questions if something is unclear or if you get stuck.

2. Ask for Time

Do not be afraid to ask for time to think if you are stumped. Interviews are a high-pressure situation and you are not expected to immediately know the right direction to head.

3. Flustering

Do not fear not knowing, and do not be thrown off your game by questions you cannot solve. Many people who get into Oxbridge come out of their interview feeling dissatisfied and unhappy – we even know people who have cried and still made their offer!

4. Be Robust on your Personal Statement

Whilst personal statement questions usually make up a small part of the interview (if any at all), it is important that you are secure and knowledgeable about all the topics you have mentioned. Make sure that you have enough depth to your knowledge to be able to have a proper discussion with your tutor. Questions about your personal statement are an excellent opportunity to demonstrate your passion for your subject – so make sure you do!



5. Laying Out Working

Lay out your work clearly and neatly; draw plenty of diagrams so both you and the interviewer fully understand everything going on. Make sure these diagrams are fully labelled. Clearly set up your equations and state any laws (e.g. conservation of energy) that you are applying. If you are resolving or taking moments, state the direction in which you are doing so. It is good practice to label your equations to allow both you and your interviewer to follow your working. Following these steps will help you to avoid making silly mistakes.



Resources

We have compiled a table of resources below to help you prepare for the aptitude tests. Some of these resources are also great for interview prep. Most of these resources are free and should collectively provide you with plenty of material from which to prepare.

Resource (click on resource for link)	Description	Useful for?	Cost	Difficulty
A level Papers	Useful for creating a solid base of understanding of the whole admissions test/interview syllabus. Should be used mainly to iron out gaps in knowledge.	Admissions test	Free	Easy
Textbooks	Similar to A level papers. Useful for revising topics but should be used sparingly – reading and rewriting large sections of a textbook is a very inefficient use of time.	Admissions test	Ideally you have some	Easy
I want to study engineering	Great for seeing lots of interview questions 1 by 1. Useful to do little and often. Has useful hints and videos as well.	Admissions test, interview	Free	Good Range
Isaac Physics	Great for pushing the difficulty of the A level syllabus. It grades questions on difficulty allowing you to work up to the most difficult questions. Has useful hints and videos on how to tackle questions.	Admissions test, interview	Free	Good Range



British Physics Olympiad	These questions test your conceptual understanding of A-level physics topics. The Year 12 & 13 Physics Challenge questions are useful to supplement alongside your admissions test past papers. If you want to really challenge yourself, try the Olympiad papers!	Admissions test, interview	Free	Good Range
Professor Povey's Perplexing Problems	This book contains a number of conceptually difficult interview-style problems. Povey lays out solutions to each problem so you can see how to break them down.	Interview	£13.22	Hard
200 Puzzling Physics Problems	A challenging set of problems that is likely to push you. Great interview practice.	Interview	Free	Hard



Personal Experiences

In this section our tutors detail their own admissions experiences. Please get in contact with us if you would like to find out more.

Kelan Patel

Hi! My name is Kelan and I am currently a 4th year engineering student at Balliol College, Oxford. I took the PAT in 2016 before interviewing at Balliol College and Oriel College (if you apply for Engineering at Oxford you interview at two different colleges).

I spent most of my summer relaxing and enjoying the break between 6th form years. The university-oriented work I did was mainly aimed at personal statement preparation over the summer break; I read 3 books on engineering and also did one week of work experience.



I started preparing for the PAT in September alongside my schoolwork and probably spent an hour or two a week doing questions from Isaac Physics and I want to study engineering. A few weeks into term I started to do one past paper a week. I was fortunate in having a friend also applying to engineering at Oxford and so we often shared resources or more difficult questions we found online. Over half-term I did the bulk of my preparation; I went through the whole syllabus making sure I was familiar and did all the other past papers available that I had not yet done. I made sure to build up my work towards the PAT so that I did the most work in the week before the test.



Armaan Kamerkar

Hi! My name is Armaan and I am a 4th year Manufacturing Engineering Student at Queens' College, Cambridge. Over summer, I mostly tweaked my personal statement and built a set of speakers as a practical hands-on project. Towards the end of summer, I polished my understanding of the A-level syllabus and then hit the ground running in the Autumn term, doing ENGAA and PAT past papers and trying to get myself in the correct mindset for Oxbridge questions. I significantly ramped up my workload in the weeks leading up to the ENGAA – peaking at the perfect time. I used a lot of the free resources we offer on our website in preparation for the ENGAA. Despite coming out of the exam unhappy, I later was told I had performed well in the ENGAA.



In the lead up to my interview, I tried to organise mock interviews with unfamiliar characters (Physics teachers at school), and got into the habit of doing questions whenever possible. Working through problems with friends was especially helpful in getting used to verbalising your thoughts. Again, I came out of my interview thinking I had messed things up, because I really was pushed to my limit.

Aran Veneik

Hi, my name is Aran and I am a 4th year Engineering Student at New College, Oxford. I took the PAT in 2016 and had two interviews: one at New College and one at Lady Margret Hall.

To prepare for the PAT, I first made some concise notes on the syllabus to make sure I knew all the relevant formulae and understood the key concepts. I then went through the PAT past papers systematically to prepare for the test in the weeks leading up to it.



In terms of preparing for the interview, I made sure I was solid on my A-level fundamentals and then I tried to attempt as many different practice questions as I could, ranging from the classic mechanics/calculus questions to some more unusual and interesting ones. I found doing mock interviews and talking through problems with friends particularly useful because they enabled me to practice verbalising my thoughts.

Billie Meadowcroft

My name is Billie and I have just finished my 4th year of Natural Sciences at Queens' College Cambridge. I had a test and two interviews at Queens'; one for Physics and one for Chemistry. The most important thing I did to prepare for the interview was talking to my teachers and friends about parts of the A-level syllabus I felt unsure about throughout the year. Having this verbal practice of talking about your ideas is important! After doing the test I felt confident but after my Interviews I felt deflated. I even cried halfway through my physics interview. Despite this I managed to get an offer, so my tears thankfully did not put them off! I applied for a deferred entry and having a year off was great for me. However, I was told my maths would get rusty, so I did an online maths course over that year.



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