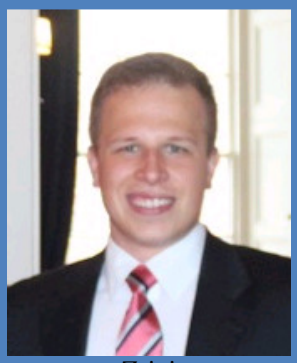
King's Student Perspectives

Chemical Engineering via Natural Sciences

Zsigi, 4th year

What attracted you to Chemical Engineering as a subject to study at university?

At school I enjoyed Mathematics, Physics, Chemistry and Biology. Although I was strongly attracted to outstanding research and the sciences, I was really looking to study a more applicable / real-world subject at university than the pure sciences. As my mother always used to say, I am a problem solver. With these prerequisites and interests I decided that Chemical Engineering would be the course for me.



Zsigi

Why Cambridge in the UK?

Even though studying at Cambridge had always seemed to be something that Isaac Newton or Lord Byron did, and not young students from Hungary, I decided to apply to Cambridge precisely because of its international reputation for academic excellence and that fact that it is home to one of the world's best Chemical Engineering departments. What also attracted me to Cambridge Chemical Engineering was the unique course structure: I was able to enjoy the advantages of being a "NatSci" (a natural scientist) in first year, and choose from the vast array of Natural Sciences options, before beginning my path to becoming a chemical engineer.

Front Court, with King's Chapel on the left

Many, if not all, of my friends and family in Budapest were truly astonished when I broke the news that I had decided to apply to Cambridge, as they still believed in strong and out-dated stereotypes. Their surprise was even bigger when I was accepted! But as it turns out, Cambridge is a truly colourful place: where you come from, be it from India or just around the corner, fifteen miles from Cambridge, does not influence your chances at Cambridge in the slightest.

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What was starting at King's like?

King's is a truly special place even within Cambridge. This is something that until today I struggled to explain to even my other Cambridge friends. We were of course told of the academic achievements that were expected of us, but never did I experience an atmosphere where academic encouragement attained a racing or competing style. We felt much more that our academic achievements should be for our benefit. I very much enjoyed this healthy attitude in College, so it was very easy to get off to a good start at King's, get to know everybody and make friendships for life. I have never truly met anyone at King's who I couldn't talk to or with whom I did not share at least some interests.

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Of course, it was a big change for me, moving so many miles away from home, and living on my own for the first time in my life. In reality, I only had fifteen minutes or so to truly register that, because after that freshers' week started: all freshers were keen to make friends and the older students were always there to answer our questions or just to get to know us. Before I knew it, I was surrounded by friends and I started to call Cambridge a second home. From then on, I was never truly alone at King's or anywhere in Cambridge for that matter.

How are Chemical Engineers taught?

Compared to Chemical Engineering courses offered at other UK universities, the Cambridge course is very theoretical in nature: the emphasis is on understanding the fundamental concepts. Besides interactive lectures, a useful tool that helps us to understand the ideas conveyed is the continuous assessment – students have to submit various pieces of coursework throughout the year, ranging from lab reports, through process analysis, to the detailed design of your very own heat exchanger. Supervisions in Chemical Engineering are additional to the lecture courses and laboratory sessions, and tend to be in groups of two to four students with a supervisor. "ChemEngers", as we are called, tend to have approximately one, one-hour supervision every two weeks on each module that is taught during the term. Before these sessions, students are expected to have solved (or attempted) the questions on the respective problem sheet for that week. The supervision can then be structured around the problems you or your group have found difficult. Supervisions tend to be relatively informal and provide an excellent opportunity to go over subject areas that you might not have understood in lectures. As Chemical Engineering has its own department, supervisions are usually held in the department by a professor or lecturer in the field.

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The high number of coursework assignments, as well as lectures and supervisions throughout my ChemEng years, meant that I was always busy. At first, this can seem overwhelming. However, with time one develops a certain routine, and we all developed very good time management skills.

What was the first year in Natural Sciences like?

For me, it was a great experience to study Natural Sciences first, as I have always had a great interest in the pure sciences. I took Maths B, Physics, Chemistry and Material Sciences for my papers, and of these, Material Sciences proved to be particularly useful throughout my Chemical Engineering years. In fact, I enjoyed my first year so much that I was even tempted to continue on with theoretical physics, but in the end I decided to stick to my original application choice and pursue ChemEng.

Having now finished my Chemical Engineering degree, I still value that first year very much as I found many great friends both within King's and the across the University, not just strictly from my subject group. Over my four years at uni, I feel lucky to have both had the benefit of being part of the biggest subject year group in Cambridge for a year and also enjoyed all the advantages of studying my chosen subject in our very own little department.

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Was it very different when you started second year?

Chemical Engineering was quite different to the first year NatSci papers, because already in every lecture as a ChemEnger you could sense the real-world approach that the lecturers took and the examples they used to explain the concepts. First year Natural Sciences is a tough year because of the transition from school to university and the immense amount of material that you have to learn. Compared to that, second year ChemEng had less material, but there were more difficult concepts, so it required a more mature and experienced approach from the students.

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engineers, process and product design models, an introduction to biotechnology and bioengineering, but also concepts such as corrosion, reactor engineering and control theory.

In your fourth and final year you'll have the option of choosing from a great range of courses besides doing one compulsory module in each of the first two terms. Topics range from the more classical aspects of Chemical Engineering, such as fluid mechanics and catalysis, to new areas such as biosensors. In addition to the substantial amount of teaching, students, in pairs, join a research group in the department and complete a year-long research project that constitutes roughly 25% of the end-of-year mark. This is a great opportunity to gain better insight into research and potentially even publish your own paper.

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Does it matter whether you come to Chemical Engineering via Engineering or via Natural Sciences?

The short answer is no. Both people coming from Engineering and from Natural Sciences have to take conversion courses in second year to catch up on things that the respective others have already learnt in their first year. But there is no increased workload for anyone as the ChemEng department takes care of that.

Where does the teaching take place?

The Chemical Engineering department, where all lectures and supervisions take place, is located on the New Museums Site, a short 5 minute walk away from King's. In this respect, too, King's is the ideal place to be.

Everybody's favourite place in the department is the tea room, which is the social melting pot of the department. Twice a day we get served free tea and can sit together with other year groups and also our lecturers and academic staff. It provides an excellent

The equipment and labs are in the Chemical Engineering department on the New Museums Site

opportunity for relaxing between lectures, asking a bit more about the course material or just discussing the past week's events.

The Chemical Engineering course is highly structured with a high pre-defined workload, which means that you will spend a large amount of time in the department, compared to people doing other subjects. This will most likely strengthen departmental bonds more than some other courses. From the 2014/15 academic year onwards the department will move to a newly constructed building on the West Cambridge site, which is slightly further away (though still only a 10 minute bike ride). This will bring the great advantage of being able to learn in the most modern facility in the university, however.

How do you find the workload for Chemical Engineering?

As the workload is very high (as with most subjects at Cambridge) and we have a lot of contact hours, i.e. our weeks were very structured, I found that it was very important for me to take part in many other activities in order to give myself some much needed distraction and also mix things up a little. Ultimately, as one of my supervisors used to say, Cambridge is all about being smart about when and how you work, and supervisions are there to help.

Being at King's and at Cambridge in general is a fantastic opportunity to get involved in a wide range of sports or extra-curricular activities. Be sure not to miss the freshers' fair where myriads of societies will aim to grab your attention. Taking part in these activities and joining new societies is a great way to make new friends and to give yourself a break by taking your mind off your work.

Freshers' Fair

Personally, I rowed for for King's for two years, captained the squash and tennis college teams, played in the University American football team, and was also on the committees of the Science Society, the ChemEng society and KCSU (King's College Student Union). I actually found that the more things I did, the more time I felt I had, as there was little room left for procrastination.

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There are also so many opportunities throughout the university to meet new people, and this is especially true for King's. People are very open-minded and students here spend a lot of time together thanks to King's bar, which is a great social venue. The student

union organizes various activities here, ranging from pool tournaments and salsa classes all the way to our very own 'King's got Talent'.

Where have you lived?

The style of accommodation in King's ranges from traditional 18th century rooms to very modern rooms. During my four years at King's I aimed to try a variety of these, such that I have lived in the sprawling maze that is Spalding Hostel out the front of College and above the pubs of Benet Street, Webb's Court in the centre of College, close to King's Library, the newly modernized Market Hostel and lastly on Keynes 4th floor, just above our very own college bar. The later two rooms had en-suite bathrooms, which was certainly an advantage, but at the same time they lacked the true Cambridge flare of the more traditional rooms I lived in earlier. For me, it was always my neighbours and the people who lived on the same floor with me who made my time memorable, rather than the exact details of what the individual rooms I had were like.

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What are the exams like in Chemical Engineering?

The Chemical Engineering course is mostly assessed through end-of-year exams. You have to take four exams lasting three hours each. Around 20-30% of the overall mark is derived from coursework, which consists of lab reports and a series of extended, analytical reports at the end of projects throughout the year (the projects normally last three to five weeks each). I think that it is important to realize that while coursework can provide some easy marks compared to exams, it is best not to spend too much time on these reports. It is better to really make sure that you understand the concepts when they are taught so that revision for the exams is easier.

What do you do in the vacations?

I did industrial internships during the summer after my first and third year. The department strongly urges people to gain work experience over the summer holidays before the final year as this makes it easier to find suitable jobs afterwards. The "teaching consortium", a group of leading international chemical engineering firms who support the department both financially and also from a teaching content perspective, also organizes various career events throughout the year specifically to enable our department to show students what a career in Chemical Engineering – ranging from oil refining through pharmaceutical research to process control - might look like. A lot of students also choose to have research placements during the summer, to enable themselves to

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make more informed choices about the possibility of staying in academia for further research after their undergraduate studies.

What advice would you give to sixth formers who are interested in applying for Chemical Engineering?

Chemical Engineering is a very interesting course where you learn a variety of skills and also gain a lot of knowledge. As the course here has a very broad structure, it is very useful for prospective students to be open minded and interested in a range of aspects in the sciences. The course is also quite mathematically intensive so Further Maths at A-level (or equivalent) certainly helps where possible. I wouldn't recommend any particular books, but much more highlight the benefit of curiosity about the subject. Also, being up-to-date about recent developments and knowing why you want to study ChemEng is an advantage.

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Do you know what you're going to do next?

Both the department and the companies that support the teaching are very helpful and informative when it comes to deciding on what career interests you most and how to find your first job. The weekly career events held in the department, where both international and smaller UK firms come in and talk about their opportunities specifically for us Chemical Engineers, certainly help with that.

Zsigi talking to Geoff Moggridge (Director of Studies) at Graduation

Equally the Fellows (academics in the colleges) and professors are very eager to give more information on opportunities for further studies and to talk about possibilities in academia. I personally look forward to three relaxing summer months before I start my PhD in Chemical Engineering at MIT.

A note to current King's Chemical Engineers

If you would like to write about your experiences of studying Chemical Engineering at King's for our prospective students to read, please email Kristy in the Admissions Office for further details: undergraduate.admissions@kings.cam.ac.uk