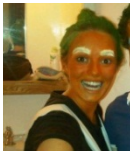


Natural Sciences at Pembroke, 2011



Hello! I am Sarah, one of the three Natsci reps. Last year I took Cells, Physiology of Organisms (shortened to PoO – this is just one example of the science banter that goes down in Cambridge), Evolution and Behaviour and Mathematical Biology.



Hi, my name is Chen; I'm a 2nd year Natsci originally from Canada interested in neuroscience and psychology. Last year I took Chemistry, Physics, Maths B and Biology of Cells.



Hello, I'm Bella, also studying pure Bio like Sarah. Life as a scientist at Pembroke is hard work but great fun, and there's still plenty of time to do everything else you want to as long as you're a bit organised.

Pre-arrival advice:

Pre-reading: There is no compulsory pre-reading, so read things that interest you if you want, but don't start cramming. Enjoy the holiday.

Maths: If you get some maths questions in the post, have a good go at them (especially if you took a gap year), as they are designed to get your brain back into a maths mode. It is not a test and is for your benefit only. Brushing up on your A-Level (or equivalent) maths will certainly make life easier for you.

What to expect:

Lectures: Each subject has 3 lectures per week, amounting to 12 hours of lectures a week in first year.

Labs: This largely depends on which subjects you are taking, although on the whole it is one practical per week per subject, which can take all afternoon! It's a real mixed bag, some great, some tedious – but all helping us become better scientists so we can save the world etc etc.

Supervisions: You have one per week per subject, lasting one hour and usually in groups of 2 or 3. The more involved you are in the supervision, the more you will get out of it. Now you have made it through the interviews, everyone is there to help you, so don't be scared of getting answers wrong! If you do, the supervisor may just say (speaking from experience)... "That's an interesting point.... But actually no...."

On the whole you will be set something each week by each supervisor. Some weeks seem really light, and then suddenly it starts piling up. Just think that every essay or set of questions acts to help you understand and learn the contents of the course, making revision a little bit easier. Science essay writing may be entirely new to you, but don't worry- it is for everyone. Your supervisor will help you. The first couple of weeks will move slightly slower than the rest, but it's pretty constant after that. You'll probably be busy every weekday from 9-5, with supervision work on top taking up a couple of hours a night. Again, although this sounds like a lot, it is completely manageable.

A quick tour of the Part 1A options:

Biology of Cells: Cells is time consuming but rewarding, the course seems to go at lightning pace but at the end of the year you really feel you have learnt a lot. This is chosen by almost all Bios, and a lot of "bio-curious" Physical Natscis... prepare for lots of pipetting in the practicals

Physiology of Organisms: A great companion to the biology of cells course, this covers the workings of animals, plants and microorganisms. Animals are the main focus of the first term (nerves, muscles, cardio, kidneys, ventilation etc), plants in the second (which are a LOT more interesting than their boring reputation at A-level!), then a bit of everything in the last term. Practicals often involve testing on your lab partner and can be quite exhausting. The course is splattered with interesting factlets like why giraffe's heads don't explode with blood pressure. This was Bella's favourite module last year!

Evolution and Behaviour: E&B has an enormous scope, from theories on the beginnings of life, the evolution of multicellularity, plants, a rapid sweep through the branching of the animal kingdom, right through to tool use in primates and the origin of *Homo sapiens*. There's more evolution than behaviour. Sarah became slightly obsessed with chimpanzees after this course.

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Computer Science: This course has a very steep learning curve and at times can be a bit tedious. However with a little persistence CompSci is extremely rewarding and very useful. It is strongly recommended as an option for anyone who might like to learn how to program, even if you have never done it before, as the course is designed to accommodate people who have no previous experience.

Earth Sciences: Not many people take Natural Sciences with a view to choosing Geology and it's a testament to the department and the course that such a large number who take it as a fourth choice at 1A are converted and take it forward into IB and beyond. While it's true that looking at (and perhaps on occasion licking) rocks is an acquired 'taste', the variety of topics covered and the universally enjoyed field trip to Arran over Easter make it a thoroughly enjoyable option for anyone, biological or physical sciences oriented.

Physics: Lectures start off slower initially, (to ease freshers in, it seems), but will rapidly pick up pace and discuss fascinating topics like wave mechanics and relativity. Another thing to notice is how the Maths course greatly complements the Physics one, and you may find what you're learning in the Maths course will suddenly be applied in Physics! Practicals are once every other week and there are two assessed formal lab reports (one small one, and one large one).

Chemistry: Lectures cover the whole spectrum of chemistry, and therefore offer something for everybody. For example, those who like abstract ideas may enjoy learning about atomic orbitals and those who like patterns may enjoy learning about periodic trends. Organic chemistry is highly focused on predicting mechanisms, and reasoning through them logically. Whether you are interested in the physical sciences or the biological, you may find chemistry very useful. Practicals are once every other week.

Materials Science: Materials science covers the more practical areas of chemistry and physics, using the fundamentals of science to eventually solve problems more relevant to the macroscopic world of engineering. You will gain an understanding of everything from solid state physics through to airplane design.

Everyone takes one of the four maths options listed below. Lectures can take a little getting used to initially (you can't stop the teacher and ask if you get lost!) but don't panic- it does get easier.

Maths A: Maths A starts by revising core A Level material, as well as introducing some concepts which may be new to those who did not take Further Maths, such as hyperbolic functions and complex numbers. In the following two terms most people find the majority of the material is new, such as the solution of advanced differential equations and vector calculus. People of many different abilities take Maths A, from those who are setting themselves a challenge, to those who are competent in maths but want to concentrate on their other subjects instead of choosing Maths B.

Maths B: Covers roughly the same material as the Maths A course, but presents some more generalized theorems and pure-maths results that are not touched on in Maths A. Maths B may therefore seem like more work than Maths A, but if you are interested in the beauty of pure maths, Maths B comes recommended, and may allow you the ability to do a greater variety of questions on the Tripos Maths A paper! (both maths A and B take the same paper)

Mathematical Biology: Brushing up on graph drawing, differentiation and integration will be helpful for the first few weeks. Mathematical Biology touches on advanced differential equations, population modelling, physiological modelling and statistics, and is quite fast paced. No prior knowledge beyond A-level (and absolutely no statistics) is assumed, so if you have done Statistics or Further Maths you may find you already have met some of the concepts, in which case, lucky you! Bella hadn't done any maths for over two years before coming to Pembroke (and was never very good at it then!) and it all went fine in the end.

Elementary Mathematics: for those who haven't done A-level maths (or equivalent).

A final message: It's easy to think everyone will be smarter than you – they won't be. If you are ever feeling overwhelmed, your supervisors, your D.O.S. and all of the second years will be there to help you. Don't worry about work or exams just yet, just get excited for starting at Pembroke! If you have any questions, please don't hesitate to contact us, either by email or on facebook!

We look forward to meeting you all in fresher's week!

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