



UNIVERSITY OF  
CAMBRIDGE

# Natural Sciences 2020 Entry



# What is Natural Sciences?



The rigid scientific disciplines of the past are blurring and the Natural Sciences Tripos\* reflects that there are no hard boundaries between the different sciences.

## Why study Natural Sciences?

Natural Sciences is the framework within which most of the sciences are taught in Cambridge and allows you to study a range of both biological and physical sciences.

The flexibility of Natural Sciences means you can:

- Study a range of new and familiar areas in the sciences before deciding what to specialise in.
- Discover the interconnections between apparently diverse subjects.
- Gain experience of using a range of different scientific methods.



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*"Being taught by your subject's leading minds is an experience in itself and who can explain ideas better than the people who actually came up with them!"*

**Nick,  
Natural Sciences Student**



# Why Study Natural Sciences?

## Study science as it is in the real world

Biological problems are increasingly being solved using techniques which require an understanding of physics and chemistry, just as the more pressing problems being addressed by chemists and materials scientists require an understanding of biology. The Natural Sciences course can provide you with experience in a range of different scientific disciplines that will enable you to make links between those disciplines.

### Choice

A significant proportion of students change direction within the framework and end up studying entirely different specialisms to the ones they anticipated at the outset of the course. The Tripos system also allows some flexibility to change the Tripos in the third year.

### New Subjects

Try out new subjects which are not normally studied in schools, such as Materials Science, Earth Sciences and Genetics. Students taking the Chemical Engineering course can also study Natural Sciences for the first year.

### Why study at Cambridge?

Whether you are studying liquid crystals, ion channels in cell membranes, black holes or holes in the ozone layer, the world class University of Cambridge is one of the most exciting places to study for a science degree.

We have some of the world's best scientists, teaching and researching at the very forefront of current scientific knowledge, and tackling some of the most important challenges of today—and tomorrow.

We'll be teaching you not only to become a scientist, but to become one who progresses their area of science over the coming years; someone with their own ideas and opinions who initiates rather than imitates.

### How can a Cambridge graduate share the same level of knowledge as those from a single science course?

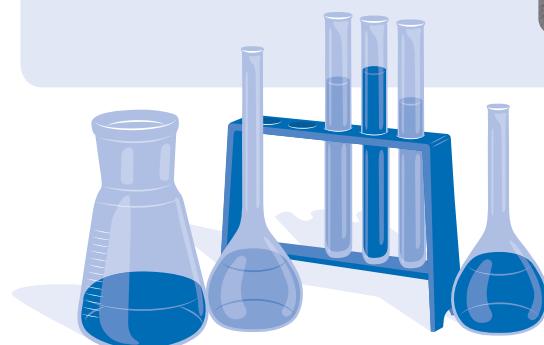
Our graduates are expected to have achieved the same standard and depth in their final year subject as graduates from narrower courses elsewhere for three reasons:

- Our students are some of the most able and work very hard.
- We provide them with world class teaching and learning facilities.
- The range of subjects studied in the first two years provides a broader and deeper foundation for the final year specialism than single subjects elsewhere.

### Transferable skills

The flexibility of the Natural Sciences course will not only give you a broad scientific background and an in-depth knowledge of the subject in which you finally specialise, but will also enable you to acquire a wide variety of all important transferable skills that are so much in demand by employers in all sectors, for example:

- Intellectual skills (e.g. critical thinking, analysis, problem solving)
- Communication and presentation skills (including written skills)
- Organisational skills (e.g. independent work, time management)
- Interpersonal skills (e.g. teamwork, negotiation, delegation)
- Research skills (e.g. data management, critical analysis)
- Numeracy and computer literacy



# Teaching

## Lectures and Seminars

Lectures provide a foundation for your studies and provide an opportunity to hear about a topic from an expert—in many cases experts who are working in the forefront of scientific research. You may even find that you hear about recent research long before it is available in a textbook! Seminars are less formal than lectures and provide an opportunity to discuss a particular topic with a smaller group of students, led by an academic.



### Practicals

Practicals are an important part of all Natural Sciences subjects as they demonstrate the real-life aspects of the lectures. Practical classes will be at the heart of your learning process but they will be very different to the experiments and manipulations you may have done at school up to now. During your course, practicals might involve techniques ranging from microscopy, through to computer modelling and could involve the use of complex electronic equipment.



### Supervisions

Supervisions are small-group teaching sessions led by a specialist in the subject you are studying. Supervisions are one of the distinctive features of teaching at Cambridge and will enable you to keep up with the fast pace that is demanded by the NatSci course. Supervisions will give you a chance to clarify anything you are not certain about, to discuss advanced topics, to engage in in-depth problem-solving, and to explore topics that particularly interest you. You will probably find supervisions both useful and challenging. You will usually be expected to prepare some work for each supervision so, as well as increasing your scientific knowledge, they will also develop your written and oral communication skills.

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*"The third year research project helps you to see if you want a career in research and the lab experience is highly appreciated by employers and institutes."*

**Sophia, Natural Sciences Student**

### Original Work and Research Projects

As a Natural Sciences student you will be expected to produce an original piece of work, in the form of a research project, dissertation or both. Many students undertake at least one research project in the third or fourth year. This may give you a chance not only to make a genuine contribution to current scientific knowledge—it's not uncommon for project work to be published in scientific literature—but also to discover whether a career in research would be right for you.

### Field Trips

Some subjects will require you to go on a field trip or course, whilst for others they may be optional. Popular field trips currently include a first year Earth Sciences trip to the Isle of Arran, a second year Plant Sciences visit to Portugal and a third year Tropical Field Course to Panama organised by Zoology.

For more information about costs, visit this webpage: [www.natsci.tripos.cam.ac.uk/prospective-students/costs](http://www.natsci.tripos.cam.ac.uk/prospective-students/costs)



**Name:** Phattharaporn

**First year subjects:** Earth Sciences, Computer Sciences, Mathematics, Physics

**Final year specialisation:** Astrophysics

**Describe NatSci in 5 words:**

Life-changing, new horizons, great combinations



**Name:** Samuel

**First year subjects:** Physiology of Organisms, Biology of Cells, Chemistry, Mathematical Biology

**Final year specialisation:** Psychology, Neuroscience and Behaviour

**Describe NatSci in 5 words:**

Challenging, explorative, pioneering, personal, exciting



**Name:** Ella

**First year subjects:** Physiology of Organisms, Biology of Cells, Evolution and Behaviour, Mathematical Biology

**Final year specialisation:** Pathology

**Describe NatSci in 5 words:** rigorous, personalised, eye-opening, sociable, academic



**Name:** Shreshth

**First year subjects:** Physics, Chemistry, Materials Science, Mathematics

**Final year specialisation:** Physics

**Describe NatSci in 5 words:**

Broad, challenging, engaging, diverse, flexible



**Name:** Hao Zhe

**First year subjects:** Mathematics, Physics, Chemistry, Materials Science

**Final year specialisation:** Materials Science

**Describe NatSci in 5 words:**

The hard work pays off

## Careers

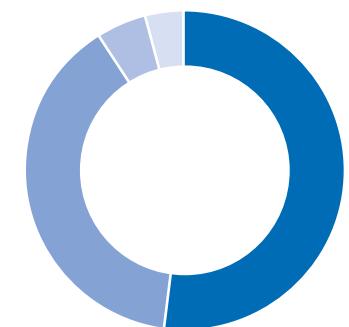
### What can I do with a Natural Sciences Degree?

A good degree from Cambridge opens a great number of doors, and a broad based course like Natural Sciences is excellent preparation for many careers in a huge variety of areas, not just the scientific sphere. The skills you develop here will make you highly employable in a range of fields.

#### In 2017 graduates joined these sectors...

- Research (Science)
- IT Sector
- Banking and Investment
- Accountancy and Tax
- Arts and Recreation
- Communication Business
- Engineering and Architectural Consultancy
- Manufacturing, Utilities and Power
- Public Service

**90%**  
of graduates were employed after six months or progressed to further study\*



- In employment – 52%
- In further study – 39%
- Travelling/unavailable for work – 5%
- Still seeking employment or study – 4%

\*Graduates completing between 1 August 2016 and 31 July 2017.  
Percentage is based on graduates who responded to survey.

# Pathways through the course

Students are only asked to choose their options after being successfully admitted on to the course. You will not need to make these decisions prior to making an application.

## Year 1 (Part IA)

### Choose three subjects from

- Biology of Cells
- Chemistry
- Earth Sciences
- Evolution & Behaviour
- Materials Science
- Physics
- Physiology of Organisms

**AND**

### Choose one from

- Mathematical Biology
- Mathematics

## Year 2 (Part IB)

### Choose three subjects from

- Biochemistry & Molecular Biology
- Biology of Disease
- Cell & Developmental Biology
- Chemistry A
- Chemistry B
- Ecology, Evolution & Conservation
- Evolution & Animal Diversity
- Experimental Psychology
- Earth Sciences A
- Earth Sciences B
- History & Philosophy of Science
- Materials Science
- Mathematics
- Neurobiology
- Pharmacology
- Physics A
- Physics B
- Physiology
- Plant & Microbial Sciences

Students may also start with Natural Sciences in Part IA and move to Chemical Engineering in Part IB and beyond.



## Year 3 (Part II)

### Choose one subject to specialise in

- Astrophysics
- Biochemistry
- Chemistry
- Earth Sciences
- Genetics
- History & Philosophy of Science
- Materials Science
- Pathology
- Psychology, Neuroscience & Behaviour
- Pharmacology
- Physics
- Physiology, Development & Neuroscience
- Plant Sciences
- Psychology
- Zoology

**OR**

### Choose a broad science course

- Biological & Biomedical Sciences
- Physical Sciences

**Find more information about each subject at:**

[www.undergraduate.study.cam.ac.uk/courses/natural-sciences](http://www.undergraduate.study.cam.ac.uk/courses/natural-sciences)

# Admissions and Subject Requirements

## Entry Requirements

### Typical Offer:

**A Level** A\*A\*A

**IB** 40-42 points with 776 at Higher Level

Other Qualifications see:  
[www.study.cam.ac.uk](http://www.study.cam.ac.uk)



## Subject Requirements

You need to have a strong knowledge base across a wide range of science/mathematics subjects. You must have a minimum of two science/mathematics A Levels to apply. Most applicants have three of the following A Levels (or equivalent):

- Biology
- Chemistry
- Mathematics
- Physics

## Year 1 (Part IA) Options and Subject Requirements

Many options in the first year have individual A Level (or equivalent) subject requirements. This means the number of options will be affected by your choices at A Level. Taking additional science/mathematics AS levels may strengthen your application and increase the number of subjects you will be able to take. Some second and third year subjects also have recommended A Levels.

The next page outlines individual requirements for each option offered in the first year.

### Which maths course?

There are two mathematics courses in the first year to choose from; Mathematics and Mathematical Biology.

Your Director of Studies will advise you on what will be the most appropriate mathematics course for you. This might be based on the subjects you have chosen in your first year and on the level of mathematics you have reached prior to starting the course. However, if you study Physics, you must also study Mathematics.

Choose THREE from	A Level Requirements	Other
Biology of Cells	<b>Highly Desirable:</b> Chemistry <b>Useful:</b> Biology	
Chemistry	<b>Essential:</b> Chemistry (Mathematics is also essential to continue to Chemistry A in Part IB) <b>Highly Desirable:</b> AS or A Level Mathematics	
Earth Sciences		No previous knowledge of the subject required.
Evolution and Behaviour	<b>Highly Desirable:</b> A Level Biology	
Materials Science	<b>Essential:</b> Mathematics and either Chemistry or Physics	No previous knowledge of the subject required.
Physics	<b>Essential:</b> Mathematics and either Physics or Further Mathematics (With three units of Mechanics) <b>Useful:</b> Further Mathematics	
Physiology of Organisms	<b>Useful:</b> Biology and/or Physics	
Plus ONE from		
Mathematics	<b>Essential:</b> Mathematics	Essential if you are taking Part IA Physics.
Mathematical Biology	<b>Highly Desirable:</b> Mathematics	Students with GCSE Mathematics can take the course but are required to do some self study before arrival in Cambridge.

# Options Year 2 (Part IB)

Opposite are the prerequisite subjects for Part IB courses.  
Please note that some more unusual subject combinations  
may not be possible due to timetabling restrictions.



## Choose THREE from

Biochemistry and Molecular Biology

## Part IA subjects

**Essential:** Biology of Cells

**Recommended:** Knowledge of A Level Chemistry is assumed

Biology of Disease

**Recommended:** Biology of Cells and/or Physiology of Organisms

Cell and Developmental Biology

**Essential:** Biology of Cells

Chemistry A

**Essential:** Chemistry and either Mathematics (preferred) or Mathematical Biology

**Recommended:** Physics, Materials Science

Chemistry B

**Essential:** Chemistry

**Recommended:** Biology of Cells

Ecology, Evolution & Conservation

**Recommended:** Evolution and Behaviour, Physiology of Organisms, A Level Biology

Evolution & Animal Diversity

**Recommended:** Evolution and Behaviour in particular, Biology of Cells and Physiology of Organisms are helpful

Experimental Psychology

**Essential:** Earth Sciences

Earth Sciences A

**Essential:** Earth Sciences

Earth Sciences B

**Recommended:** Materials Science

History and Philosophy of Science

**Essential:** Mathematics

Materials Science

**Recommended:** Physics

Mathematics

**Recommended:** Physiology of Organisms is particularly helpful, or one other biological subject

Neurobiology

**Essential:** Physics and Mathematics

Pharmacology

**Essential:** Physics and Mathematics

Physics A

**Essential:** Physics and Mathematics

Physics B

**Essential:** Physiology of Organisms or Biology of Cells

Physiology

**Recommended:** One or more of Biology of Cells, Physiology of Organisms, Evolution and Behaviour

# Options Year 3 & 4 (Parts II and III)

Most students choose to specialise in ONE subject in Year 3 (Part II). However, there is an opportunity to take a more general course—Biological and Biomedical Sciences, or Physical Sciences—in which you would choose two subjects from a wider range of options. Successful completion of the third year leads to the award of a BA degree.

Due to the amount of laboratory space available, there is some restriction in numbers for some of the Part II subjects. Please note, though the majority of students are able to progress to their first choice Part II Subject, this cannot be guaranteed.

Specialist Subject	Part I subjects
Astrophysics *	<b>Recommended:</b> Part IB: Physics A, Physics B and Mathematics
Biochemistry*	<b>Essential:</b> Part IB: Biochemistry and Molecular Biology or Cell and Developmental Biology
Chemistry*	<b>Essential:</b> Part IB: Chemistry A and Chemistry B
Genetics	<b>Recommended:</b> A Level Biology. Part IA: Biology of Cells and/or Evolution and Behaviour and/or Part IB: Cell and Developmental Biology
Earth Sciences*	<b>Essential:</b> Part IB: Earth Sciences A and/or Earth Sciences B
History and Philosophy of Science*	<b>Recommended:</b> Part IB: History and Philosophy of Science
Materials Science*	<b>Essential:</b> Part IB: Materials Science
Pathology	<b>Recommended:</b> Part IB: Biology of Disease
Pharmacology	<b>Essential:</b> Part IB: one biological subject or Chemistry A and/or B <b>Recommended:</b> Part IB Pharmacology
Physics*	<b>Essential:</b> Part IB: Physics A and Physics B



Continued	Part I subjects
Physiology, Development and Neuroscience	<b>Recommended:</b> Part IA: Physiology of Organisms. Part IB: Physiology and/or Neurobiology and/or Cell and Developmental Biology
Plant Sciences	<b>Recommended:</b> Any Part IA or Part IB biological subject
Psychology	<b>Recommended:</b> Part IB: Experimental Psychology or Neurobiology
Psychology, Neuroscience and Behaviour	<b>Recommended:</b> Part IB: Neurobiology
Systems Biology (Part III only)*	<b>Essential:</b> Part IA: Mathematics or Mathematical Biology or Part IB: Mathematics
Zoology	

\* This subject can be taken for a fourth year (Part III) leading to a MSci degree. These are typically chosen by students wishing to pursue a career in academic or commercial research. For requirements for progression onto Part III subjects visit <http://www.natsci.tripos.cam.ac.uk/students/fourth>

# Further Information

## Natural Sciences Course Details

☞ [www.natsci.tripos.cam.ac.uk](http://www.natsci.tripos.cam.ac.uk)

✉ [natsci@admin.cam.ac.uk](mailto:natsci@admin.cam.ac.uk)

## Studying at the University of Cambridge and General Admissions Guidance

✉ [www.study.cam.ac.uk/undergraduate](http://www.study.cam.ac.uk/undergraduate)

## Further Questions

Please get in touch with any of  
the college admissions offices:

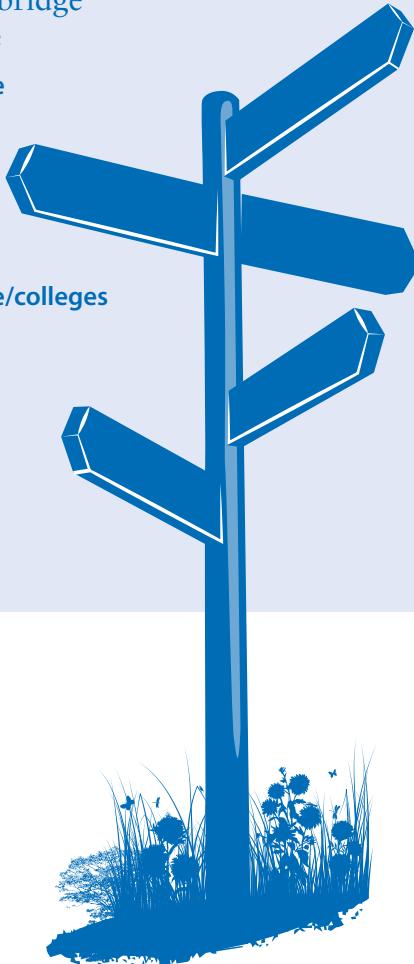
☞ [www.study.cam.ac.uk/undergraduate/colleges](http://www.study.cam.ac.uk/undergraduate/colleges)

OR

Cambridge Admissions Office

✉ [admissions@cam.ac.uk](mailto:admissions@cam.ac.uk)

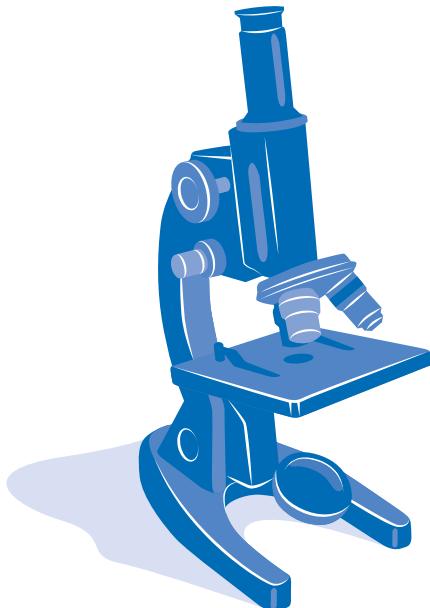
# Notes



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*"I have loved studying Natural Sciences for the past three years, as I have found all of the different courses interesting individually, and the links between them have really deepened my understanding. In first year, I enjoyed the crossovers between my three science courses, which really helped my understanding of those concepts, as I had them explained to me from multiple angles."*

**Rachel**



For more information contact one of the College admissions offices or:

**Cambridge Admissions Office**

**01223 333308**

**admissions@cam.ac.uk**

**[www.undergraduate.study.cam.ac.uk](http://www.undergraduate.study.cam.ac.uk)**

Details are correct at the time of printing (March 2019) but should be checked against the NatSci website for the most up-to-date information