Natural Sciences
Key Facts

Lancaster University offers one of the most flexible Natural Sciences degree schemes in the country with over 100 degree programmes to choose from. Unlike other institutions which package disciplines together, at Lancaster you choose your own combinations.

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How to use this booklet

This booklet provides a snapshot of the modules you can expect to study here at Lancaster. The mandatory modules are highlighted on a coloured background and the optional modules are shown on a white background.

Module choices

You will notice that in most cases, modules in first year are fixed and more options open up in subsequent years. This is intentional as our pathways have been expertly selected so that your first year covers as much ground as possible to keep your later options open.

Many Year 2 and Year 3 non-mandatory modules have pre-requisites from the previous year’s modules. Once you have decided on your pathway modules, these will be discussed in detail at a one-to-one meeting at the start of your course where timetable flexibility and course capacity will also be taken into consideration.

Pathway entry requirements

To study on any particular pathway you must meet the entry requirements of that particular subject. Please see page 6 for the relevant information.

Disclaimer

The University makes all reasonable efforts to ensure that the information in this brochure is correct at the time of printing (June 2018). Please see lancaster.ac.uk/compliance/legalnotice for further information.
I chose Natural Sciences at Lancaster as the degree was by far the most flexible. It allowed me to pick and choose (throughout my course) which modules interested me most.

The University is an incredibly friendly and welcoming place where the staff and students are approachable and helpful. My lecturers also operate an open-door policy, so if you have any problems they are more than happy to help.

Astrophysics and Cosmology are definitely my favourite topics. Studying these topics has developed my numerate and problem solving skills, as well as the ability to apply appropriate independent techniques to the bigger picture and communicate complex concepts effectively, all of which are key transferable skills in many careers.

During my degree I took a linked pair of modules called Mathematical Education and Placement. My primary school placement allowed me to set the theory I had learnt into context and to apply and refine teaching techniques. This was a fantastic experience and not only furthered my confidence in the classroom but also cemented my passion for teaching. After graduating, I am going into a career in teaching.

I have loved my time at Lancaster because it has offered me a seemingly endless variety of opportunities from participating in cutting-edge academic research to meeting and working with people from a myriad of backgrounds and disciplines. I firmly believe that Lancaster offers the best of both worlds; it is a high achieving academic institution but also places equal emphasis on the social and personal development side of student life too. The academics are passionate about teaching and are there to help, not catch you out!”

Jake Harding
MSci Hons Natural Sciences. Graduated with a 1st Class.
Entry Requirements

The standard entry requirements for all of our courses are A*AA - AAA at A level with at least two of these being in science subjects, and to grade B in GCSE mathematics. In addition, entry to some first year pathways may require that you hold A level qualifications in particular subjects.

A levels

The standard entry requirements for all of our courses are A*AA - AAA at A level with at least two of these being in science subjects, and to grade B in GCSE mathematics.

In addition, entry to some first year pathways may require that you hold A level qualifications in particular subjects.

Enquiries are welcomed from candidates with other qualifications, e.g. GNVQ, BTEC, Open University, Open College, ONC, HNC, HND, Scottish Highers, Irish Leaving Certificate and International Baccalaureate.

• We also welcome applicants offering a range of overseas qualifications
• Enquiries from candidates considering a future application or deferred entry are also welcome
• All applications must be made through the UCAS scheme

For more information visit lancaster.ac.uk/natsci-entry

To study on any particular pathway you must meet the entry requirements of that particular subject. Please see below those pathways which have specific A level entry requirements:

<table>
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<tr>
<th>Subject</th>
<th>A level Requirement</th>
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<tbody>
<tr>
<td>Chemistry</td>
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Lancaster offered a degree with flexibility which I didn’t see in other universities, with the opportunity to put together a truly unique scheme of study for my interests.

Through physics I got particularly interested in computer modelling – even though when I was applying to university I expected to take a more theoretical/mathematical approach.

I spent my second year abroad in the USA, before transferring onto the MSci. It was a fantastic opportunity to explore another country and to take some different courses. The experience introduced me to teaching and research techniques used across the pond which I'm hoping to be able to apply moving forward.

I’m beginning a PhD in Astrobiology which will combine some of the physics and chemistry I’ve studied, as well as introducing biology to the mix! The ability to study multiple subjects at undergraduate level has given me a solid foundation as I continue my career.

You can pursue so many things through natural sciences, so experiment! If there’s a subject you’re unsure of, take it as one of your three choices in first year and see where it takes you. I originally saw myself heading down a physics and maths route and took chemistry on a whim. I’ve ended up following it through to my final year.

Lancaster is perfectly placed near to the bustle of big cities, the freedom of the seaside, and the peace of the Lake District - all within an hour’s drive! There’s everything you could possibly need – both academically and otherwise and all the departmental staff are incredibly friendly!”

Pete Higgins
MSci Hons Natural Sciences (Study Abroad). Graduated with a 1st Class.
Structure Your Degree

MSci or BSc? You may enrol on either the three year BSc honours degree or the four year MSci honours programme. The delivery of both programmes is identical in years one to three, and then in fourth year, the MSci students undertake a major research project and study specialist modules delivered by lecturers who are experts in their field. You are able to transfer between the MSci and the BSc up until the end of third year.

Flexibility

Our Natural Sciences degree programme is designed to exploit the flexibility of Lancaster’s modular degrees and is underpinned by world-leading research (REF 2014). Our pathways are illustrative of the subjects you can study, however we encourage you to talk to us about your preferred selection of subjects so that we can guide and advise you on the best route to match your interests and strengths.

In your first year you will normally study three subjects, two of which must come from the following disciplines:

- Biological Sciences
- Computing
- Engineering
- Environmental and Earth Science
- Geography
- Mathematics
- Medical School
- Physics
- Psychology

Non-science subjects

The third subject may be another science or non-science subject.

It is possible to take up to 25% of your studies in a non-science subject. Almost any subject taught at Lancaster University is available to students on the Natural Sciences programme provided they meet the pre-requisites, it fits with their timetable and the module has the capacity. Examples of non-science subjects studied are: Management, European Languages, Philosophy and History.

First year (Part I)

During your first year you will complete 15 modules, 5 in each of your chosen subjects, though other variations are possible. Each module covers a particular aspect of a subject and is typically 12 to 15 lectures in length and incorporates a large amount of laboratory based practical work. Successful completion of the first year allows you to progress to second year.

After a broad-based first year, you will specialise in particular areas within each discipline, allowing you to study where your interest really lies. A particularly attractive feature of the Natural Sciences degree is that at the end of the first year there are some possible options available to you:

- Continue to study your original three subjects
- Drop one of the original subjects and continue with a two subject degree

The flexibility of the scheme has helped those students who were reluctant to commit themselves to a single subject in their first year and has provided valuable ‘breathing space’ for them to tailor their studies to suit their particular talents and interests.

Years 2 and 3 (Part II)

From your second year you will have the opportunity to specialise by choosing pathways within a discipline. Your choices will be influenced by the subjects you selected in first year.

For more information please visit lancaster.ac.uk/natural-sciences
I wanted to explore a different country and immerse myself in its culture. The Lancaster Natural Sciences programme offered the flexibility and ability to customise and tailor my degree that I desired. In addition, its Study Abroad options were as good as, if not better than, those offered by my other university choices. I really liked the friendly and welcoming atmosphere of Lancaster, both laid back yet hard-working. It’s a modern campus in a beautiful area.

I decided to study abroad as I had not had the fortune of travelling much before I came to university, so jumped at the chance to spend 10 months abroad. I was very lucky to have been placed in the University of Boulder, Colorado. There were too many highlights to write about – but memorable events were hiking trips to Arches National Park and up 14,000ft mountains in the Rockies, a road trip to Yellowstone, learning to snowboard, waking up to sun or snow nearly every day, going on a month-long tour of cities across the country, to name but a few.

After completing my degree I will be starting a 12 month placement within the chemistry team at EDF Energy’s nuclear power station at Heysham.

If you’re thinking of studying a natural sciences degree then pick the subjects you enjoy, and don’t be afraid to ‘evolve’. I took Biology, Chemistry and Maths in 1st year, but shifted towards Environmental Science, Environmental Chemistry and Biology over the subsequent years.”

Sam Allan
MSci Hons Natural Sciences (Study Abroad).
Graduated with a 1st Class.
Employability

Preparing you for your future career is important to us.
We believe that relevant work experience while you are at university
is crucial to achieving a good graduate job. Not only that, we offer
a comprehensive careers service providing advice and guidance on
writing CVs and job applications, and preparing for interviews.

Internships

We have an extensive network of businesses
providing a range of full and part-time paid for
internship opportunities in areas that are relevant
to your degree. You get to apply your knowledge in
the real-world and businesses get the skills they
need. Honing the skills that are much sought after
by employers, such as team working, commercial
awareness and time management will give you an
edge in the job market.

Future careers

A multidisciplinary degree, such as natural
sciences, opens up a wide range of career
opportunities. Natural Science graduates
are highly sought after for their technical and
practical skills that can be transferred across
many industries. Students develop careers in
management, banking, teaching, consultancy,
medicine and research. Others go on to
further study.

“After graduating I was employed by a
pharmaceutical company as a quality analyst.
I worked in a laboratory conducting scientific tests and
analyzing results for the manufacture of inhalers. After
two years I decided to change my career and completed
my PGCE. I am now a secondary school science teacher
specialising in chemistry. This is a whole new challenge!”

Annika Hall

Studying Natural Sciences allowed me to
continue studying all the subjects I loved at
A level while still specialising and learning in a
world-class environment.

You are very well supported at Lancaster both in the
individual departments and in Natural Sciences. Through
support from the Science and Technology Faculty, I was
diagnosed with dyslexia. I now receive extra support
and funding. I also have academic advisors in each
department who make sure you make all the right
choices during your studies.

Lancaster is brilliant for providing lots of different types
of modules and ways to study. Knowing I did well in my
labs I took as many as I could, including Experimental
Principles of Particle Detection. Working alongside active
researchers from places like CERN and Fermi Labs has
confirmed that I would like a career in particle research.

The departments at Lancaster are brilliant for updating
you about work opportunities and internships. I’ve
worked with young people on a number of internships
including maths skills with Lancaster University’s
Students’ Union (LUSU), a company called Mad Science
where I presented science demonstrations, and Teach
First where I shadowed teachers and delivered my own
lesson. I’m currently participating in an internship called
Teach Physics run by the Ogden Trust. This is another
opportunity to develop my skills, to work with people
from different backgrounds, to help me be more prepared
for the world of work, as well as finding out if I want to
pursue a career in teaching.

I am also on the Study Abroad scheme and am looking
to study in the US next year. I can’t wait to experience
a new culture which could help my confidence in the
working environment but also experience new ways of
studying.

You get out what you put in at Lancaster! There are so
many options and opportunities that I couldn’t imagine
these being offered elsewhere. Research these when
looking at different universities and you will see just how
flexible Lancaster’s Natural Science degree is!”

Lucy Wood
MSc Hons Natural Sciences (Study Abroad), Third Year

lancaster.ac.uk/natural-sciences
Biology Pathways

Biology

Fundamental biological mechanisms are related to the environmental challenges of the 21st century such as food security, environmental pollution, ecosystem functioning, sustainable resource management and biodiversity conservation. You will be trained in the scientific study of interactions between organisms and the environment, and how these are modified by human activities.

YEAR 1

MANDATORY MODULES
- Aquatic Ecology
- Developmental Biology or Marine and Estuarine Biology
- Evolutionary Biology
- Global Change Biology

OPTIONAL MODULES
- Field Course in the Spanish Doñana (This module may be taken in place of any of the core modules above except Evolutionary Biology and Zoology)

YEAR 2

MANDATORY MODULES
- Environmental Physiology
- Evolution

OPTIONAL MODULES
- Field Course in the Scottish Highlands
- Field Course in Kenya – Tropical Biology and Conservation

YEAR 3

MANDATORY MODULES
- Principles of Biodiversity Conservation

OPTIONAL MODULES
- Coral Reef Ecology
- Introduction to Eco-Innovation
- Research Design and Delivery

Ecology and Conservation

Interactions between organisms, the environment and humanity are often complex. You will receive a thorough grounding in ecological theory and how these biological principles relate to the conservation of wildlife and ecological habitats. The pathway also concerns the practice of ecology and has a strong fieldwork component designed to encourage you to develop your practical skills.

YEAR 1

MANDATORY MODULES
- Aquatic Ecology
- Biodiversity and Conservation or Marine and Estuarine Biology

OPTIONAL MODULES
- Field Course in the Spanish Doñana
- Field Course in the Scottish Highlands

YEAR 2

MANDATORY MODULES
- Coral Reef Ecology
- Environmental Physiology
- Evolution

OPTIONAL MODULES
- Field Course in Kenya – Tropical Biology and Conservation
- Field Course in the Scottish Highlands

YEAR 3

MANDATORY MODULES
- Coral Reef Ecology
- Issues in Conservation Biology

OPTIONAL MODULES
- Animal Behaviour
- Dissertation

Biochemistry and Cell Biology

Cellular biochemistry examines the macromolecular structure and the relationship of cellular organisation to the central pathways of intermediary metabolism and the physical processes underlying cellular functions. Cell biology covers the interactions within and between cells which allow them to perform their function in the whole organism. Genetics examines the mechanisms of heredity, moving through Mendelian genetics and its extensions to molecular genetics.

YEAR 1

MANDATORY MODULES
- Biotechnology
- Cell Structure and Function
- Genetics
- Molecules of Life
- Protein Biochemistry

OPTIONAL MODULES
- Biochemical Techniques
- Biochemistry
- Bioinformatics
- Cell Biology
- Cell Biology Techniques
- DNA Technology
- Genetics

YEAR 2

MANDATORY MODULES
- Biology of Ageing
- Cancer
- Cell Cycle and Stem Cells
- Cell Signalling
- Cell Signalling, Transport and Disease
- Genetics
- Medical Genetics
- Protein Structure, Function and Evolution

OPTIONAL MODULES
- Cancer
- Clinical Immunology
- Environmental Pathogens
- Molecular and Biochemical Parasitology

YEAR 3

MANDATORY MODULES
- Anatomy and Tissue Structure
- Hormones and Development
- Human Physiology
- Impact of Microbes
- Infection and Immunity

OPTIONAL MODULES
- Cell Biology
- Cell Biology Techniques
- Genetics
- Medical Microbiology
- Microbiological Techniques

Microbiology and Biomedicine

This pathway contains a balanced mixture of biochemistry, microbiology and physiology. It attempts to demonstrate the relevance of microbiology to human affairs, whether the connection is direct, e.g. diseases of humans, or indirect, e.g. the control of diseases of food crops. Although some lectures deal specifically with one group of microbes, i.e. bacteria, fungi or protozoa, entire modules emphasise ecological and functional relationships between different groups of microbes.

YEAR 1

MANDATORY MODULES
- Biochemical Techniques
- Medical Microbiology

OPTIONAL MODULES
- Cancer
- Clinical Immunology
- Environmental Pathogens
- Molecular and Biochemical Parasitology
- Tropical Diseases
Chemistry Pathways

Chemical Measurement and Analysis
Chemical theory and analysis relates to the measurement, rationalisation, and prediction of the chemical and physical properties of individual molecules and bulk materials. This pathway covers the theory and practical application of techniques in physical, analytical, and computational chemistry. It also prepares you for potential research projects in physical and computational chemistry in your final year.

Chemical Synthesis and Structure
Chemical synthesis concerns the creation of new molecules. Key to this is understanding molecular reactivity and mechanism, techniques to design and synthesise molecules, and how we can characterise and measure their properties. This pathway develops knowledge and practical skills across all of synthetic chemistry and prepares you for potential research projects in chemical synthesis in your final year.

Environmental Chemistry
Environmental chemistry specifically relates to the chemistry of the aqueous, atmospheric and terrestrial environments. This pathway is designed to give a thorough grounding in chemistry whilst covering the techniques and methodology of environmental chemical analysis, together with an introduction to environmental planning and assessment. Due to the complexity of this subject and the background knowledge it requires in later years, this pathway is double weighted. As such you can only take one other pathway with this option.
Computing Pathways

Computing and Communications

The School of Computing and Communications is one of the UK’s leading departments (positioned 12th in REF2014) offering an extensive portfolio of high quality programmes for undergraduate and postgraduate study, taught by a team of around 50 acknowledged world experts in their field. This pathway covers practical storage and usage of data and digital media and its applications. Some computing experience is necessary.

YEAR 1

Mandatory Modules
- Software Development

Optional Modules
- Advanced Programming
- Computer Networks
- Computer Science Group Project
- Human-Computer Interaction
- Innovative Design Group Challenge
- Introduction to Computer Graphics
- Operating Systems
- Software Design

YEAR 2

Mandatory Modules
- Calculus
- Computer and Control
- Differential Equations
- Electrical and Electronics Fundamentals
- Fundamentals of Chemistry for Engineers
- Fundamentals of Digital Electronics
- Fundamentals of Electronic Instrumentation
- Further Engineering Mathematics
- Introductory Engineering Mathematics
- Process Engineering Fundamentals

Optional Modules
- Instrumentation and Control

YEAR 3

Mandatory Modules
- Analogue Electronics
- Digital Signal Processing
- Integrated Circuit Engineering
- Optoelectronics and Wireless Communications

Optional Modules
- Engineering Analysis
- Instrumentation and Control

Engineering Pathways

Electronic and Electrical Engineering

Our Electronic and Electrical Engineering pathway will help you develop a sound foundation in all aspects of Electronic and Electrical Engineering that is crucial to the design and manufacture of future systems in the medical, environmental, energy, transport and ICT markets. You will also have the opportunity to specialise in areas including wireless communications, silicon chip design, nanotechnology, green technologies and power generation.

Due to the complexity of this subject and the background knowledge it requires in later years, this pathway is double weighted. As such you can only take one other pathway with this option.

YEAR 1

Mandatory Modules
- Calculus
- Computer and Control
- Differential Equations
- Electrical and Electronics Fundamentals
- Fundamentals of Chemistry for Engineers
- Fundamentals of Digital Electronics
- Fundamentals of Electronic Instrumentation
- Further Engineering Mathematics
- Introductory Engineering Mathematics
- Process Engineering Fundamentals

Optional Modules
- Instrumentation and Control

YEAR 2

Mandatory Modules
- Analogues Electronics
- Digital Signal Processing
- Integrated Circuit Engineering
- Optoelectronics and Wireless Communications

Optional Modules
- Engineering Analysis
- Instrumentation and Control

YEAR 3

Mandatory Modules
- Analogue Electronics
- Digital Signal Processing
- Integrated Circuit Engineering
- Optoelectronics and Wireless Communications

Optional Modules
- Engineering Analysis
- Instrumentation and Control

Mechanical Engineering

Mechanical Engineering is a field covering any industry that uses moving parts, from construction to transport; medicine to manufacturing; renewable energy to consumer technology. Our programme gives you the skills necessary for the subject, with an applied focus on mechanical system designs.

Due to the complexity of this subject and the background knowledge it requires in later years, this pathway is double weighted. As such you can only take one other pathway with this option.

YEAR 1

Mandatory Modules
- Calculus
- Computers and Control
- Design, Innovation and 3-D Thinking
- Differential Equations
- Fluid Mechanics and Thermodynamics
- Heat Transfer
- Introduction to Engineering Thermodynamics
- Energy Conversion
- Life Cycle Analysis
- Nuclear Instrumentation

Optional Modules
- Engineering Mechanics
- Fluid Mechanics and Thermodynamics
- Materials and Design

YEAR 2

Mandatory Modules
- Engineering Mechanics
- Fluid Mechanics and Thermodynamics
- Materials and Design

Optional Modules
- Engineering Analysis
- Instrumentation and Control

YEAR 3

Mandatory Modules
- Engineering Mechanics
- Fluid Mechanics and Thermodynamics
- Materials and Design

Optional Modules
- Design and Manufacturing
- Engineering Materials
- Machine Elements
- Vibration Analysis and Application
Environmental & Earth Science Pathways

Earth Science

The solid rocks that comprise Earth’s upper crust contain a record of change driven by processes originating from the core to the atmosphere over a period exceeding 2 billion years. This pathway provides the basic skills needed to read this record and understand how Earth has evolved over both long and short periods of time. You will have the opportunity to take a number of field-based modules in both the UK and abroad.

Environmental Science

This pathway aims to train you in those areas of natural science (including chemistry, physics, biology, mathematics, geology, physical geography) that are used to understand natural and anthropogenic processes on the surface of the Earth, rivers, lakes, oceans and the atmosphere, as well as Earth’s internal processes, against the backdrop of environmental change.

Year 1

Mandatory Modules: Atmospheric, Weather & Climate; Biogeochemical Cycles; Earth’s Interior; Hydrology; Water in the Environment

Optional Modules: Subject to A level portfolio, students may be required to replace one of the above modules with one of the following: Introduction to Environmental Chemistry; Numerical Skills I

Year 2

Mandatory Modules: Aquatic Biogeochemistry; Geoscience in Practice; Introduction to Geophysical Techniques; The Dynamic Earth

Optional Modules: Dissertation; Data Collection and Analysis; Field Course in Devon - Hydrological Processes; Field Course - Volcanic Processes; Geological Hazards; Hydrogeology

Year 3

Mandatory Modules: Geographical Skills and Application in a Changing World; Society and Space - Human Geography

Optional Modules: Africa Geographies of Transformation; Cities and Globalisation; Climate and Society; Dissertation; Dissertation with External Partner; Energy: Controversies and Decision-Making; Environment, Politics and Society in Amazonia; Environmental Governance; and the Biodiversity Crisis; Field Course in the Brazilian Amazon - Conservation and Sustainable Development; Field Course in Croatia - Water, Society and the Istrian Landscape: Environmental Management in a Mediterranean Context; Field Course in New York - Inequality and the City; Geographies of Health: Understanding and Tackling Inequality; GIS: Principles and Practice; Global Consumption; Independent Research Perspectives on Technology and Environment; Urban Infrastructure in a Changing World

Human Geography

This pathway provides you with an understanding of society, culture, development and issues of globalisation within a framework of environmental issues in the 21st century.

Year 1

Mandatory Modules: Geographical Skills and Application in a Changing World; Society and Space - Human Geography

Optional Modules: Children’s Geographies; Cultural Geography; Field Course in Paris - Globalizing Food; Food, Politics and Culture; Geosocial Spaces; Introduction to Eco-Innovation; People and the Sea; Political Geography; Research Project Skills; Spatial Analysis and GIS

Physical Geography

You will learn about the main components of our ‘Earth-system’, how environments have changed in the past, what controls the dynamics of environments in the present, and how we can predict changes in the future. All this is studied in the context of an interconnected planet.

Year 1

Mandatory Modules: Environmental Process and Systems; Geographical Skills and Application in a Changing World

Optional Modules: Aquatic Biogeochemistry; Atmospheric Science; Capture and Hydrology; Environmental Data Visualization and Analysis; Field Course in the Mediterranean - Investigating Mediterranean Environments; Introduction to Eco-Innovation; Physical Geographical Theories and Concepts; Research Project Skills; Soil Science; Spatial Analysis and GIS

Year 2

Mandatory Modules: Earth Surfaces Processes; Interacting Landscapes; Biogeography and Geomorphology

Optional Modules: Dissertation; Dissertation with External Partner; Environmental Remote Sensing and Image Processing; Field Course in Croatia - Water, Society and the Istrian Landscape; GIS: Principles and Practice; Global Sustainability; Independent Research; Lakes, Rivers and Estuaries; Migration for Environmental Problem Solving; Quaternary Environmental Change
### Medical School Pathways

#### Human Physiology and Exercise Science

This brand new pathway provides students interested in science and physical education with a solid foundation in application and performance modules. These will help to increase your understanding of the functions and regulations of the human body and physiological integration of the systems.

#### Year 1

**Mandatory Modules**

- Essentials of Sports and Exercise Physiology
- Exercise Prescription
- Fundamental Anatomy of Movement
- Fundamentals of Biomechanics
- Introduction to Nutrition

#### Year 2

**Mandatory Modules**

- Anatomy and Biomechanics II
- Sport and Exercise Physiology

**Optional Modules**

- Advanced Training for Performance
- Applied Digital Health Technology
- Entrepreneurship II
- Injury Prevention and Rehabilitation
- Nutritional Application and Challenges

#### Year 3

**Optional Modules**

- Current Debates in Sport and Exercise Science
- Entrepreneurship
- Exercise Referral
- Strength and Conditioning (Sports Medicine)
- (Sports Medicine)

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### Mathematics Pathways

#### Single Mathematics

This pathway allows you to continue your study of Maths at degree level in a top ranking department. You’ll focus on both pure mathematics and statistics with an emphasis on solving practical maths problems.

#### Year 1

**Mandatory Modules**

- Calculus
- Further Calculus
- Linear Algebra
- Probability
- Statistics

**Optional Modules**

- Abstract Algebra
- Computational Mathematics
- Linear Algebra II
- Probability II
- Statistics II

#### Year 2

**Optional Modules**

- Abstract Algebra
- Computational Mathematics
- Linear Algebra II
- Probability II
- Statistics II

#### Year 3

**Optional Modules**

- Bayesian Inference
- Combinatorics
- Elliptic Curves
- Financial Mathematics
- Geometry of Curves and Surfaces
- Graph Theory
- Groups and Symmetry
- Likelihood Inference
- Mathematical Education
- Medical Statistics
- Multivariate Statistics in Machine Learning
- Number Theory
- Representation Theory of Finite Groups
- Rings, Fields and Polynomials
- Stochastic Processes

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#### Double Mathematics

For those wishing to focus their studies on Mathematics, we also offer a double-weighted pathway that allows you to study the subject in greater detail. This incorporates the maths modules listed above and gives you the opportunity to concentrate on theoretical problems.

#### Year 1

**Mandatory Modules**

- As above, plus:
  - Convergence and Continuity
  - Discrete Mathematics
  - Geometry and Calculus
  - Integration and Differentiation
  - Numbers and Relations

**Optional Modules**

- As above, plus:
  - Complex Analysis
  - Project Skills
  - Real Analysis

#### Year 2

**Optional Modules**

- As above, plus:
  - Differential Equations
  - Hilbert Space
  - Lebesgue Integration
  - Linear Systems
  - Metric Spaces
  - Probability and Measure
  - Project Skills

#### Year 3

**Optional Modules**

- As above, plus:
  - Differential Equations
  - Hilbert Space
  - Lebesgue Integration
  - Linear Systems
  - Metric Spaces
  - Probability and Measure
  - Project Skills
Physics Pathways

Physics

This pathway provides a working knowledge and understanding of the physics of fluids and solids, especially their thermal and electrical properties, with emphasis also in computing, classical mechanics and quantum physics. This pathway requires a set of first year maths-based modules, either through the Physics Department (under the heading Physical Systems) or the Mathematics Department (under the heading Single Mathematics), both listed on the previous pages. As such, students taking Physics can only take one other pathway in addition to either of the supporting Maths pathways.

YEAR 1

MANDATORY MODULES

Classical Mechanics
Complex Methods
Electric and Magnetic Fields
Functions and Differentiation
Integration
Quantum Physics
Series and Differential Equations
The Physical Universe
Thermal Properties of Matter
Vector Calculus

OPTIONAL MODULES

Introduction to Experimental Lab

YEAR 2

OPTIONAL MODULES

Advanced Nanoscale Microscopy
Astrophysics II
Astrophysics Laboratory
Atomic Physics
Computer Modelling
Cosmology Group Project
Cosmology II
Energy
Flavour Physics
Groups and Symmetries
Low Temperature Physics Laboratory
Particle Physics
Particle Physics Group Project
Physics Literature Search
Physics of Fluids
Physics of Global Warming
Physics of Living Systems
Semiconductor Physics Laboratory
Solid State Physics
Space and Auroral Physics
Statistical Physics
Theoretical Physics Group Project
Theoretical Physics Independent Study

YEAR 3

OPTIONAL MODULES

Astronomy
Astrophysics I
Classical Fields
Cosmology I
Electromagnetism, Waves and Optics
Experimental Lab I
Experimental Lab II
Experimental Lab III
Experimental Principles of Particle Detection
Maths I
Maths II
Mechanics and Variations
Quantum Mechanics
Relativity, Nuclear and Particle Physics
Scientific Programming and Modelling Project
Thermal Properties of Matter

Psychology Pathways

Psychology

This pathway develops your range of knowledge and skills in order to continue your study of psychology at degree level.

YEAR 1

MANDATORY MODULES

Understanding Psychology

OPTIONAL MODULES

Cognitive Psychology
Developmental Psychology
Foundations of Cognitive Neuroscience
Social Psychology

YEAR 2

MANDATORY MODULES

Investigating Psychology
Understanding Psychology

OPTIONAL MODULES

Cognitive, Affective and Clinical Neuroscience
Culture in Cognition and Development
Forensic and Investigative Psychology
Hot Topics in Social Psychology
Precise Nation:
Human Psychopharmacology
Psychology of Art
Psychology of Meditation
The Developing Mind
The Lying Brain: An Examination of Hallucinations and Delusions in Normal, Clinical and Pathological Populations
The Neuroscience of Typical and Atypical Social Development
The Psychology of Attention from Laboratory to Everyday Behaviour
Topics in Clinical Psychology

YEAR 3

MANDATORY MODULES

Psychology with BPS accreditation

This double-weighted pathway allows you to study psychology and receive accreditation from the British Psychological Society. It can only be taken alongside one other pathway and cannot be taken by BSc students intending to study abroad due to the accreditation regulations.

YEAR 1

MANDATORY MODULES

Understanding Psychology

YEAR 2

MANDATORY MODULES

Cognitive Psychology
Developmental Psychology
Foundations of Cognitive Neuroscience
Social Psychology

YEAR 3

MANDATORY MODULES

Psychology Literature Search
Psychology of Fluids
Psychology of Global Warming
Psychology of Living Systems
Semiconductor Physics Laboratory
Solid State Physics
Space and Auroral Physics
Statistical Physics
Theoretical Physics Group Project
Theoretical Physics Independent Study

lancaster.ac.uk/natural-sciences

lancaster.ac.uk/natural-sciences
Come and Visit Us

Book a campus tour online at lancaster.ac.uk/visitus

Open Days and Campus Tours
Join us at one of our many Open Days or Campus Tours and take the time to find out as much as you can about Lancaster University. In addition, you can meet with staff and students from Natural Sciences to help you find out what it is really like to study here and find out whether the University is right for you.

Campus Tour Extras
The University also offers Campus Tour Extras with a drop-in session to the departments. Take a campus tour and visit our award-winning student accommodation, a range of social venues, our library, study areas and lots more. After the tour, take the opportunity to meet an academic from Natural Sciences to find out more about the course in an informal setting.

Applicant Visit Days
If you’re offered a place on one of our degrees, you’ll be invited to an Applicant Visit Day. This provides the opportunity to give you a real flavour of what it’s like to live and study here. We will show you the University and the colleges, and you will have the chance to meet with some of our current staff and students. You will also have the opportunity to visit a number of departments for a tour of their labs and to ask our departmental academics about the different pathways.

If you cannot make one of our Applicant Visit Days then we also provide individual visits on a date convenient to you. These visits involve a campus tour with one of our experienced student ambassadors, a chat with the Director of Natural Sciences, a lab tour and lunch.

I chose Natural Sciences at Lancaster because I liked the idea of being able to study a variety of subjects throughout my first year before narrowing down my academic pursuits.

Throughout my degree I was able to get support both from the individual departments I was studying with as well as Natural Sciences.

During my degree I received a bursary from the Royal Society of Chemistry to study in the University research labs. This experience inspired me to pursue academic research as a career.

I have favoured chemistry throughout my university career, in particular inorganic and coordination chemistry. The PhD offer I have accepted combines organic, inorganic, polymeric chemistry and biology, meaning that this degree has given me an advantage over straight chemists as I have more practical knowledge of biology. I believe the Masters project in particular has helped me prepare for this career as I enjoyed the independent research and having the opportunity to work on my own.

If you’re looking to study natural sciences, have fun with your choices in first year and take subjects that sound interesting and enjoy them. You often find yourself enjoying areas of science you never thought you would.

I’ve loved my time at Lancaster as it has the uncanny ability to become home.”

Charlotte Farrow
Get in Touch

We are passionate about our subject and are always happy to answer any questions about our degrees and the application process.

Website information
For more information about our degrees and the Department please visit
lancaster.ac.uk/natural-sciences

For more information about Lancaster University visit
lancaster.ac.uk

Get in touch
If you have any further questions then please don’t hesitate to contact
Gail Sheldrick, Natural Sciences Recruitment, Conversion and Marketing Coordinator, for friendly help and advice.

T:  +44 (0)1524 5 94931
E:  g.sheldrick@lancaster.ac.uk

Facebook: @LancsUniSciTech
Twitter: @LancsUniSciTech

We look forward to hearing from you.
How to Reach Us

We’re easy to find!

By road
From the north or south, leave the M6 motorway at Junction 33 and take the A6 north towards Lancaster for about 2 miles. The University is on the right. For SatNav use LA1 4YW.

By rail
There are direct rail links between Lancaster and many of the UK’s major cities and airports. The single journey between London and Lancaster takes between 2.5 and 3 hours. Buses and taxis are available from just outside the station.

By coach and bus
Lancaster city is on the national coach network. National Express coaches call at the University. A number of local buses run from Lancaster bus station to the University every 5 minutes on weekdays.

Further details can be found at lancaster.ac.uk/travel