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ASDAN Cambridge Summer School

(2020 Summer) Course Descriptions

ASDAN China 阿思丹学院

Cambridge Summer School 2020
Course Descriptions(Ages 16-18)

19 subject options

Science

Biology

Explore the rich and varied topics in biology essential to many important and rewarding careers, such as medicine or biotechnology.
The course delves into cell theory on a much deeper and advanced level than you will have learnt before. You will discover what makes something 'alive', how life likely originated and explore interesting questions and challenges e.g. the RNA world hypothesis.
The Biology programme is designed to be challenging, but our expert tutors will guide each participant in developing a firm understanding of the university-level topics that are explored.

Key Benefits

- Bolster your knowledge of cell theory as you build a more complete biological picture of the world
- Learn how bioinformatics allowed us to map the human genome
- Critically examine the Miller-Urey experiment as you consider the implications of life on Mars
- Experience authentic student life in Cambridge University colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Macromolecules Of Life
You will examine key biological macromolecules and explore their role in living systems. You will also learn about biological membranes and consider the idea of the membrane as a dynamic structure, through the concepts of membrane transport, cell signalling and cell-cell recognition. In addition, you' ll be introduced to the importance of Proteins, Carbohydrates and Nucleic acids and discuss how these polymeric structures are constructed from simpler components.

MODULE 2: Cell Theory And Cell Structure
The session will begin by consideration of some early pioneers of microscopy (Hooke and Leeuwenhoek) and the subsequent development of the Cell Theory. You will be reminded of the two fundamental cell types (prokaryotic and eukaryotic) and then review some of their key differences. You will also examine the role and functions of various cell organelles in a eukaryotic cell.

MODULE 3: Principles Of Bioinformatics
Explore the importance of bioinformatics in life sciences. Bioinformatics is an interdisciplinary science developed using concepts from biology, mathematics, computer science and statistics. You will explore how advances in the field of bioinformatics enabled the mapping of the entire human genome and genomes of many other organisms which led to the discovery of novel drug targets and revolutionised the field of molecular medicine.

PROJECT: How Will Advances In Biological Research Impact Upon Society?

Learn how to improve your scientific writing skills through a presentation or scientific essay, exploring how Biological research impacts upon society.

Physics

The course provides you with a taste of the topics covered in an undergraduate Physics degree, while encompassing some of the fundamental questions faced in modern physics.
Due to rapidly changing developments in physics and electricity and magnetism topics conventionally taught in schools can be vastly expanded upon. Cambridge Summer School does just that, introducing you to advanced topics such as Quantum Mechanics, nuclear physics, biophysics, and Thermodynamics with the guidance of expert university tutors from leading universities.
As well as developing a sound theoretical understanding of physics, you will also develop your study skillset through independent research and in-class practical experiments, designed to test and explain behaviours observed in our world.

Key Benefits

- Explore a number of exciting topics at the forefront of scientific discovery, not usually taught in secondary school curricula
- Bridge the gap between current understanding and knowledge, key to studying physics at university
- Understand how physics is used to create some of the most recognisable products that we use everyday
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Classical Mechanics
The study of classical mechanics is basically the study of how objects move and is a topic tightly bound to the university of Cambridge via its founding father, Sir Isaac Newton. The skills required for mechanics are found in many areas of Physics, and you will extend your knowledge of high school mechanics to include more complex problems relating to kinematics.

MODULE 2: Thermodynamics And States of Matter
The matter in our universe can consist in different states, including gas, liquid, and solid – as well as plasma and Bose-Einstein condensates. In this topic, you will explore how the ability to change the state of matter has enabled us to transfer energy from one process to another. The programme will give you the opportunity to dive into specific areas, ranging from heat engines to the composition of different chemical elements.

MODULE 3: Quantum Mechanics
Newton' s laws of motion could not properly describe the movement of small objects. Electrons sometimes behaved as waves, and light seemed to sometimes behave as particles. This famous wave-particle duality led to a new theory to resolve the paradox: the Theory of Quantum Mechanics. You' ll look into the interesting consequences of quantum mechanics, such as the uncertainty principle, quantum tunnelling and the superposition theory.

Chemistry

This course introduces you to fascinating topics within university-level organic, inorganic, nuclear, nuclear and radio-chemistry, and biological chemistry. Each lesson, carefully designed by our Chemistry specialist tutors to build on secondary school material, consolidates previous knowledge and also equips you with the skills to learn advanced topics.

The curriculum explores stimulating topics such as sustainable chemistry, nanotechnology, and their implications on everyday life. Moving beyond a mere theoretical understanding of chemistry to appreciate its crucial role in the world around us.

Key Benefits

- Learn how today' s scientists are manipulating chemical compounds at an atomic level
- Explore the world of organic chemistry and advanced concepts like electronegativity
- Get to grips with thermodynamics, discuss Hess' law, and form new compounds using heat
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules

MODULE 1: Atomic Structure And Periodicity

You will take a closer look at the atom, by discussing some of the earlier models of atomic structure, including the Thompson, Rutherford, and Bohr models. Explore the atom, which forms the foundation of Chemistry and learn about the mole concept to perform important chemical calculations. You will also analyse the modern periodic table and discuss the fascinating trends that arise from this ordering.

MODULE 2: Introduction To Quantum Mechanics And The Hydrogen Emission Spectra

In the 20th century there were several key discoveries that could not be explained by the classical description of the atom. These observations eventually led to the introduction of quantum mechanics, paving the way for our modern understanding of the atom structure and constituents. In this module, the four quantum numbers are introduced and you will be provided with key comparisons between the quantum mechanical and classical models of the atom.

MODULE 3: Experimental And Computational Techniques

In this module you' ll be introduced to some of the common experimental and computational approaches employed to probe chemical properties of molecules and reactions. Explore methods such as mass spectroscopy, infrared spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and electronic spectroscopy. You will also familiarise yourself with the various levels of accuracy in computational chemistry, and so contrast ab initio and molecular mechanics calculations.

PROJECT: Personal Project

This is one of the most exciting parts of the course. You get the opportunity to give a presentation on a topic of interest, engage in discussions with your peers, and receive important feedback. Useful transferrable skills are developed here, including oral communication, planning, data collection and analysis, critical thinking, and report writing. You will work independently on your project over the two-week period and present your report on the penultimate day of the programme. Beyond the transferrable skills, you get the unforgettable opportunity to learn about cutting-edge chemical research conducted at the world’ s top universities and institutes.

Mathematics

Throughout the maths course for 16-18 year olds, you will be introduced to university level mathematics where you will gain valuable problem solving skills, reside at a Cambridge University College, and develop new skills as you work through a carefully constructed syllabus. You will be provided with stimulating insights to help decide whether you should pursue studying maths at university level. You' ll also engage in constructive

mathematics as well as practical maths, and come away from the course knowing how the theories you learn apply in the context of the real world.

Key Benefits

- Learn about the practical applications of mathematics within the context of constructive maths
- Participate in careful, rigorous and rewarding mathematical analysis through iterative methods
- Understand complex conditional probabilities using theories such as the "Monty Hall problem"
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules

MODULE 1: Matrix Calculus

Dive into the ubiquitous nature of matrices as they are represented in equations, geometric transformations, complex numbers, and even particles used in Physics! An advantageous skill when undertaking any scientific discipline, you will start from linear systems, develop the formalism of matrices and transform them using the Gauss-Jordan method.

MODULE 2: Real' Analysis

Explore the concept and definitions of numbers like Integers, Rationals and Reals. You will engage with key definitions such as sequences, series, limits of functions, and infinite series. By tying in real-world applications, such as how infinite series allow computers to calculate any kind of function, you' ll learn to not only 'write mathematics' , but also start to understand how maths affects today' s world.

MODULE 3: Vector Spaces

Vector spaces are the way to see the underlying geometry that spontaneously arises from algebra! You' ll learn to deal with higher-dimensional spaces, where your eyes cannot see, but your mind can, through algebra. This generality is needed for instance in physics, where the theory of relativity requires a four-dimensional vector space.

PROJECT: Project Presentation

This will be the most diverse and exciting day of the programme. A session devoted to enabling both you and your peers to share your own mathematical interests, develop useful presentation skills including 'writing' mathematics, and receive insightful feedback.

Geography

The course introduces you to university level Geography topics, teaching you about how Geography intersects with diverse research fields such as international relations, cultural studies, sociology, economics and biology. The programme aims to balance both human and physical geography topics, and also emphasises the interplay between both sides of the discipline. You will learn the key questions that geographers ask of the world around us and important terminology and frameworks through which geographers examine the world.

Key Benefits

- Understand key interrelationships between society and the physical and human environment
- Learn how geography intersects with political science, economics and earth sciences
- Learn study skills including geographical research techniques and essay writing
- Experience authentic student life in University of Cambridge colleges

- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Global Events
This module focuses on geographical events and models of causation, explored through case studies including Brexit, the election of Trump, and the world' s current migratory patterns. You will consider the various ways in which they are represented in both academic circles and the media.
You will learn to think critically about past and on-going events and to and write geographically about political, social and environmental events.

MODULE 2: Global Environmental Change
Earth is threatened by human impact as never before. This module explores key global environmental issues such as climate change, land use, exploitation and pollution. You will learn to critically evaluate the drivers of change on vulnerable ecosystems. In addition, you will understand global biogeochemical cycles (e.g. C, N and Si) and how they have been disrupted by human activity.

MODULE 3: Economic Geography
This module invites you to discuss the changing ways in which geographers have conceptualised and debated economies. Engage critically with issues in contemporary economic geography such as student debt, the sharing economy and Brexit. You' ll be asked to question what counts as the economy, why, and with what implications.

PROJECT: Academic Essay
Throughout the summer school, you will have the opportunity to develop an essay on a topic of particular interest to you.
Using newly acquired theoretical frameworks and research methods, you will write an academic essay that will be critically evaluated by your tutor at the end of the programme.

Medicine

Medicine

Medicine is a subject that is not studied at school, but becoming a medical professional is a challenging yet fascinating journey encompassing a broad range of topics spanning different scientific disciplines. The programme is expertly designed to blend practical knowledge and theory that will challenge your knowledge and expand your understanding of emerging trends in medicine. You will learn university level topics such as Epigenetics, and consider the rapid advances made in medical technology. Additionally, a progressive series of dissections show you how internal systems function and interact. You will complete the course having expanded your knowledge and skills in anatomy, biology, and more!

Key Benefits
- Prepare yourself for the BioMedical Admissions Test (BMAT) and the UK Clinical Aptitude Test (UKCAT)
- Gain practical experience – you will extract and isolate DNA, dissect a cell signalling cascade, and perform a cranial nerve examination
- Discover advanced topics like pharmacokinetics, epigenetics, and optogenetics
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors

- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Medical Research: "From Bench To Bedside"
The Nobel Prize in Medicine recognises some of the world' s most important scientific breakthroughs to have revolutionised patient care and our understanding of life. But how are these discoveries made, and more importantly who makes them? You will revisit the principles of the scientific method, delve into the various stages of medical research and the growing necessity for interdisciplinary approaches.

MODULE 2: Cardiovascular And Respiratory Physiology: "Rhythm of Life"
Tireless breathing keeps our blood oxygenated, while 3 billion heartbeats a lifetime transport it around the body. You will probe scientific questions and consider current and emerging therapies to fight cardiovascular and respiratory diseases. You will also develop a deeper understanding of the roles of CPR and AED in the emergency treatment of heart attacks and address questions such as: 'Why do some people get mountain sickness?', 'Is snoring bad for you?' and 'What does an asthma inhaler do?'

MODULE 3: Neuroscience And Neuropsychology: "I Think, Therefore I Am"
You will be given an overview of the basic microanatomy and physiology of neurons, analyse how these cells produce electrical signals (action potentials) and discuss how the 37 trillion cells of your body can communicate and coordinate with one another. You' ll explore the power of the placebo effect, and challenge preconceived notions using a variety of optical, auditory and tactile sensory illusions.

PROJECT: Science Conference
Partake in a mini-science conference where you' ll present a research topic assigned earlier in the week. You will be encouraged to view each other' s work critically, ask follow-up questions and engage with the subject matter.

Veterinary Medicine

Veterinary Medicine is a subject that is not studied at school, and gaining experience in this fascinating field before committing to studying this diverse subject at university can be very challenging.
The course is expertly designed to blend practical knowledge and theory that will challenge your knowledge and expand your understanding of diverse fields within Veterinary Science. You will learn university level topics such as homeostasis, and consider the rapid advances made in technology used in the field. Additionally, a progressive series of dissections show you how internal systems function and interact.
You will emerge having expanded your knowledge and skills in anatomy, biology, and more!

Key Benefits
- Explore topics in Veterinary Medicine typically encountered at undergraduate level
- Learn biological processes and structures through a series of practical tasks
- Understand complex theory and academic tools to complement hands-on elements
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Exploring the Veterinary Profession
You will explore the broad range of opportunities that a Veterinary Medicine degree can provide. Alongside discussion of the day to day practicalities of life as a vet, you will also explore the ethics, finances and legal

considerations of a career in this field.

MODULE 2: Veterinary Anatomy and Physiology
You will explore advanced theory across a variety of species to understand the principles of a comparative approach to Veterinary Medicine. Theory is then put into practice as you' ll view a range of anatomical structures through carefully guided dissections.

MODULE 3: Neurobiology and Animal Behaviour
You will explore the structure and function of key sense organs before considering the techniques required for a neurological assessment of a range of animals. In parallel, you will also consider animal management, handling and husbandry.

PROJECT: The future of Veterinary Medicine
You will independently research a current article or paper to analyse its significance for the field of veterinary science. Present your findings to your peers and answer questions from the audience.

Psychology

The course allows you to explore some of the most fascinating topics in this complex and multidisciplinary field, from behavioural genetics to social psychology. Psychologists explore intriguing questions such as: what makes you unique? What makes you different from others? What are the motivations of human behaviour? Cambridge Summer School provides you with a forum to study, discuss and debate these questions alongside a wide range of issues, through a curriculum designed and taught by expert tutors from world-leading universities.

Key Benefits

- Gain an Insight into leading psychological theories and debates in the 21st Century
- Explore undergraduate level concepts such as biological and cognitive approaches to behaviour
- Learn what the psychology industry can hold for you as a potential career path
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: An Introduction To Psychology
Psychology is surprisingly hard to define. Broadly speaking, it is the study of the mind and behaviour, yet this definition raises more questions than it answers. Psychologists study how we think, feel and make decisions, as well as the unconscious processes and the neural mechanisms that underpin them.

MODULE 2: Behavioural Genetics: Nature Vs. Nurture
It is widely believed that psychological traits have a substantial genetic contribution. However, to what extent are they influenced by a person' s upbringing and social environment? In this module, you will see how advances in biotechnology have transformed the way we study behaviour and genes.

MODULE 3: Cognitive psychology: Seeing And Remembering
We often think that our senses and memories reflect the truth, but a wealth of psychological research points in the opposite direction. In this module, you will see how our brains are sensitive to cognitive illusions, seeing things that aren' t actually there, and missing things that are glaringly obvious.

PROJECT: Personal Project
This is one of the most exciting parts of the course. In the module, you will get the opportunity to give a presentation on an area of interest in the psychology programme, engage in discussions with your peers, and receive important feedback from your tutor, an expert in the field of psychology.

Engineering

Computer Science

Throughout the course for 16-18 year olds, you will be introduced to the topics that form the working knowledge of Computer Science, reside at a Cambridge University College, and develop new skills as you work through a carefully constructed syllabus.
You will be equipped with insights to help decide if you should pursue studying Computer Science and computer programming at the university-level. You will learn first-year Computer Science topics such as: design programs, computer graphics and software design. Which will help develop both your theoretical and practical understanding through an exciting syllabus designed by expert tutors from leading universities.

Key Benefits

- Develop practical programming knowledge in both Python and OOP
- Program Robots using Raspberry Pi through skills developed in Python
- Learn HTML5 & how to use inline, internal and external CSS style sheets
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Introduction To Programming With Python
Python is a very popular object-orientation programming language that continues to be extensively used in academia and industry. You will discover Python, tackle programming tasks, and be shown how to think programmatically, by breaking down problems so that you can tackle them with Python.

MODULE 2: Object Orientated Programming With Python
OOP expresses components as objects, packaging what you need to know about a component in a self-contained unit of code, which has its own functionality and state. You will build layers of these objects to create more powerful representations, whilst simultaneously simplifying and promoting the reuse of code.

MODULE 3: Databases And Big Data
It is estimated that we produce 2.5 quintillion bytes of data per day, or two and a half thousand million gigabytes. How do we make sense of it? How can we leverage it to our advantage, and how can we manage it? In this topic you will learn relational databases, a powerful tool that is used almost everywhere in computer science to efficiently store data.

FINAL MODULE: Project Presentation
After presenting your work and findings throughout the computer science programme, you are given the chance to be critically evaluated by your peers and tutor. This helps to solidify the theoretical and practical knowledge learnt throughout the two-week summer school.

Engineering

Throughout the programme for 16-18 year olds, you will be introduced to the engineering topics that form the foundation of Engineering at university, reside at a Cambridge University College, and develop new skills as you work through a carefully constructed syllabus.
You will be equipped with introductory insights to help decide whether you should pursue studying engineering at university level. You' ll learn first-year engineering topics and develop both their theoretical and practical understanding through an exciting syllabus designed by expert tutors from leading universities.

Key Benefits

- Explore a diverse and multidisciplinary field at university level
- Understand advanced engineering principles through a series of practical tasks
- Uncover the ideas behind some of the greatest engineering solutions of the past century
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Electrical Engineering
You will apply the principles of electromagnetism to understand a range of electrical components such as digital circuits and sensors. You will then enrich your understanding by exploring digital circuits at the base of modern laptops and smartphones, addressing their limitations. Theory is then put into practice as you construct your own radio receiver.

MODULE 2: Mechanical Engineering
Following a review of the key principles of kinematics and the Newtonian laws of motion, you will explore rigid body dynamics for 2D and 3D objects before exploring the engineering design of earthquake-resistant buildings and pitching your own ideas based on an in-class scenario.

MODULE 3: Material Engineering
At the forefront of nanoscience and nanotechnology research, you will explore this fascinating and diverse field to evaluate existing materials and consider new substances at the forefront of current research. Participants will also explore how new materials are developed and tested.

PROJECT: Engineering A Solution
Participants will be presented with a known problem and asked to work in pairs to create a solution based on the engineering principles that they have encountered. They will then present their idea and demonstrate a working prototype to their peers before facing questions.

Architecture

The Architecture course for those aged 16-18 introduces you to university-level architectural studies through an interactive, project-based academic programme where you will live and learn in Cambridge University colleges.
We equip participants with insights to help decide if they should pursue studying architectural studies at university level. You will learn first-year architectural topics and develop both your theoretical and practical understanding through an exciting syllabus designed by expert tutors from leading universities.

Key Benefits

- Learn and practice advanced skills such as axonometric and isometric drawing
- Explore architectural theory by develoing your own working design and proposal for the summer school project
- Design and craft a portfolio and understand how to present ideas to a client
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules

MODULE 1: An Introduction To University-Level Architecture

An exploration of what the study of architecture entails at university-level and a description of current practice. You will also embark on a tour of Cambridge to sketch moments and details of architectural interest.

MODULE 2: Architectural Styles Through Time

Learn the foundations of architecture by examining its earliest examples. This will enable you to consolidate your knowledge of the architecture that surrounds you in relation to theoretical and historical themes, providing a starting point for further discussion.

MODULE 3: Developing Sketching And Drawing Skills

You will tackle the most complicated form of drawing; axonometric and isometric. By the end of week 1 you will have produced a full set of meticulously crafted drawings, which will be of use for both your architectural development and confidence.

PROJECT: Architecture Project: Presenting A Design Idea

Explore the practicalities of presenting a design idea. Architecture is chiefly a profession that requires the architect to convince prospective clients of the validity of their design. You will construct A1 competition boards of your design proposals which will be presented to peers and expert tutors.

Human Science

Creative Writing

The Creative Writing courses offers the chance for you to develop your writing and enhance your creative writing skills by crafting the stimulating cultural setting of Cambridge – the academic home to some of the world' s greatest literary and creative minds such as John Milton and William Thackeray. Our creative writing courses for budding explorers, encourages you to use this setting as inspiration and push the limits of your current writing abilities, working alongside expert university tutors, and other like-minded peers. You will learn how to improve your work through various techniques on character and plot development, form and much more.

Key Benefits

- Create rich narratives, character depth, and enthralling plotlines
- Develop a written voice, master self-reflection, and identify personal strengths
- Receive constructive criticism from expert tutors and creative writing peers
- Experience authentic student life in University of Cambridge colleges

- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: An Introduction To Creative Writing
In this introductory module, you will be asked to challenge the conventional assumptions of writing in the 21st Century. You' ll discuss preferred writing methods and routines, what you hope to achieve on the programme and learn how to combat the dreaded 'blank page'.

MODULE 2: The Importance Of Character
From Sherlock Holmes to Jay Gatsby, it is often believed that great characters drive great fiction. In this module, you will assess the clichés and tropes of a range of comedic and conflicted characters, as well as analysing how they can shift the tone and plot of a piece of work.

MODULE 3: Learning The Industry: The Basics
The very best of authors with a finished manuscript can still experience setbacks from not knowing how the publishing industry works. In this module, you will learn about the various publishing options, from competitions, magazines and traditional publishing, to e-books, self-publication and film writing.

PROJECT: Written Portfolio
Over the duration of the programme, you will have written either a portfolio of creative writing or a novella. In the final module of the programme, you' ll have time to complete your works and be given personal written and verbal feedback from your tutor to aid future development as a writer.

English Literature

Is Shakespeare the greatest writer to have ever lived? What makes a piece of literature worthy of the canon? Should there be a literary canon at all? The course asks you to carefully consider what makes great literary works stand out from the rest, but also to question their value and categorisation. By taking this step back, you will have a new framework to analyse, interpret and discuss some of the most renowned literary works, whilst spending two weeks in the historic city of Cambridge.

Key Benefits
- Read and discuss everything from classical prose to contemporary verse
- Understand historical context, trends, and movements that have defined literature
- Develop personal writing, whilst building strong editing and analytical skills
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: What Is Literary Criticism?
This module considers what the purpose of literature is, and hence, what the role of literary criticism is. It does so by examining how individuals and societies have interpreted literature from the days of Aristotle to the present day. By the end of this module, you will have crafted your very own manifesto of literary criticism.

MODULE 2:
This module invites you to analyse how two key poets, John Milton and T. S. Eliot, used poetry to engage with

Biblical stories and themes. Specifically, you' ll be asked to evaluate how Milton and Eliot' s poetry enabled provocative philosophical debates on heroism, government, and hope.

MODULE 3:
In this topic, you will consider how literary structures, and physical formats of books and prints, influence their meaning. Study three different textual forms: a sonnet; an excerpt from a young children' s book from the 1780s; and a selection of texts from William Blake' s Songs of Innocence.

PROJECT: Articulating Ideas
This session will focus on the presentation of your final projects and a discussion regarding presentation, following some analysis of famous historical speeches. The discussion will encourage you to ask questions about formal essayistic structures and ask for individual feedback on your work.

History

From the performative nature of medieval European courts, to present socio-political conflicts, you will explore fascinating historical themes as well as concepts of best historical practice. This programme has been specially developed for those considering studying History and related disciplines at university-level. In addition to covering material that is studied at A-level and IB-level, you will also discover university-level study historical practice and essay skills.

Key Benefits
- Learn techniques to analyse historical sources in accordance with best practice
- Explore familiar topics from medieval through to modern history using key themes
- Develop university-style essay writing techniques and an academic tone
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Science And Discovery
You will explore science in the context of the 15th Century and seek to understand how and why scientific exploration took on new significance within the time period. Through this exploration, you' ll evaluate existing historiography and debate a narrative that the developments of the 15th Century constitute a 'Scientific Revolution'.

MODULE 2: Gender And Witch-Hunting
Discuss the rise of gender history and its own historical context before exploring gender through the lens of witch-hunting. You will be encouraged to critically analyse existing research and evaluate primary source material in order to develop your own nuanced understanding of how gendered roles were expressed, defined, or blurred, and how these roles might change under different circumstances.

MODULE 3: Court Festivals
Court pomp, ceremony and celebration was prevalent across Western Europe in the 15th Century. You will explore the performative nature of the ceremony and symbolism of these processes, seeking to understand how states and individual actors legitimised their power and authority to rule in the Early Modern period.

PROJECT: Essay
You will apply the historical theory and context that has been explored throughout the programme to create an

essay on a topic of your choice. This will incorporate the elements of best historical practice discussed early in the programme and enable you to develop research skills as you analyse both primary and secondary source material.

Business

International Relations

International Relations is an academic discipline that focuses on the study of the interaction of the actors in international politics, including states and non-state actors. The study of IR raises questions such as: What powers does the United Nations actually have? What influence does the security council have over the rest of the world? Which treaties and trade agreements have shaped relationships between countries who only decades ago were at war? You will explore these questions and global issues, group discussions, and others like them over two weeks of dynamic tutorials.

Key Benefits

- Explore core theories and ideas at the centre of the study of international relations
- Understand localised geopolitical events and instability in a global context
- Evaluate the organisational structures of key actors in the international order
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules

MODULE 1: The Middle East In International Relations

Home to the world' s three great religions and harbouring massive quantities of oil and gas, the Middle East seems to invite geopolitical attention almost by default. Nowhere else do the failings of economic and political development so closely intertwine in producing international conflict. In this module, you will explore the key international actors in this region.

MODULE 2: The Role Of Ideas In International Relations

As new global priorities have emerged in recent decades, nation states and other global actors have increasingly demonstrated their 'social' side in such fields as climate change, international human rights, and international aid. This class explores the role of ideas in IR, an approach that is typically captured by the term "Constructivism".

MODULE 3: The Project of a European Union

Today, the EU has a total population of more than 500 million people. What are the strengths and weaknesses of the European Union in today' s increasingly globalised world? This module focuses on understanding the internal structure of the EU and assesses its capabilities as a political actor in internal and external affairs.

PROJECT: United Nations Simulation

You will be assigned a country to represent at a high-level diplomatic meeting of the UN Security Council and to write a position paper about your country' s foreign policy regarding a topical political scenario. You must then present and defend your country' s position on the matter, working to form alliances in accordance with its goals.

Law

You will take part in a comprehensive curriculum covering the essentials of constitutional, criminal, human rights, and EU law. The legal profession is explored through a series of dynamic academic sessions, for example, you will leave the comfort of the classroom to visit the Cambridge Magistrates' Court. Additionally, you will be invited to take advantage of LNAT workshops where you' ll learn how to study for the challenging Law National Aptitude Test.

Key Benefits

- Explore diverse legal topics which feature in the first year of most undergraduate degrees
- Develop critical thinking skills and learn to articulate and defend nuanced arguments
- Understand the legal system in England and Wales within the context of European and International law
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules

MODULE 1: The Separation of Powers

You will explore one of the most important pillars of liberal-democratic politics and a cornerstone of British constitutionalism: the separation of powers. Discussion will centre on the purpose and value of the separation of powers and the complexity of this given that all branches of the state arguably make and interpret law.

MODULE 2: Equality Before the Law

You' ll explore the role of equality within the UK constitutional framework and in particular, considerin whether this principle is a procedural or substantive norm, applying only to rule application or itself constitutive of legal rules. Discussion then focuses on how exactly the state should respect this principle within a modern context.

MODULE 3: Evil Laws and Evil Legal Systems

In this module you will examine the conflict between natural law theory and legal positivism in greater depth. You will consider the practical implications for adopting particular conceptions of law when courts are required to deal with evil laws and evil legal systems. The Nuremburg trials help to locate and ground these implications.

PROJECT: Law in Practice

You will prepare for your assigned role as you explore a criminal law case in practice. Whether a witness, the accused, the victim the prosecution lawyer, defence lawyer or judge, all participants have a crucial role to play in the justice system and this provides you with an opportunity to see the law in action, as well as develop oratory skills.

Philosophy

Philosophy is a broad subject that permeates many fields across the humanities and social sciences. Students interested in pursuing philosophy will gain an insight into what philosophy at university level entails: from the introduction of new material, writing excellent essays, to forming and defending an argument.

The programme, designed and taught by experts from the world' s leading universities, not only introduces the historical context and areas of philosophical discussion but also the theories of famous philosophers who have shaped the thinking for centuries after them.

Key Benefits

- Develop an understanding of a number of philosophical theories and historical texts

- Learn how famous philosophers have influenced the world around us
- Benefit from the expert tutelage of some of the brightest minds in the field
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Origins: The Presocratics
In this module, you' ll examine the so-called Presocratics, Greek philosophers at the foundation of Western philosophical thought. Instead of relating to god-like entities in Ancient Greece, they looked to the four elements – water, air, fire and the earth – to explain the nature of existence.

MODULE 2: Beyond Truth And Morality: Nietzsche
For Friedrich Nietzsche humanity is anything but innocent. In this module you will examine Nietzsche' s notion that what fundamentally drives us is our 'Will to Power', our desire to dominate, even to enslave our fellow men. You will also examine how Nietzsche's views were distorted by 20th century Nazi propaganda.

MODULE 3: The Unconscious: Freud
Sigmund Freud claimed that our actions and thoughts are motivated by unconscious plans and desires. In this module, you will explore his belief that one could access the unconscious mind through dream analysis and verbal slips, as well as his tripartite structure of the mind – the id, ego and superego.

PROJECT: Personal Project
This is one of the most exciting parts of the course. In this module, you will get the opportunity to give a presentation on an area of interest in the philosophy programme, engage in discussions with your peers, and receive important feedback from your tutor, an expert in the field of philosophy.

Economics

In this course, you will learn first-year University Economics, business economics , political economics, and reside at a Cambridge University College, and develop new skills as you work through a carefully constructed syllabus.
You will be equipped with insights to help decide whether you should pursue studying Economics at university level. You will learn first-year business and political economics topics and develop both your theoretical and practical understanding through an exciting syllabus designed by expert tutors from leading universities.

Key Benefits
- Develop a fascinating insight into university-level Economics topics
- In-depth theoretical and practical knowledge in political and financial economics
- Understand how game theory affects and shapes the world political stage
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Introduction To Econometrics
You are taught how multiple regressions allows researchers to control variables that would otherwise confound one' s results, and the most commonly used tools to test hypotheses and estimate causal effects. The session

also gives you a chance to learn from methods such as natural experiments, regression discontinuities and instrumental variables.

MODULE 2: Development Economics
You will learn why some countries are vastly richer than others in the context of economic development. Explore answers to this question by focusing on the role of poverty traps, education and nutrition. You' ll understand how economic interventions can help to alleviate poverty, with an emphasis on microfinance and cash transfers

MODULE 3: Auction Theory
Auctions can be viewed as a game in which players choose how much to bid without knowing the bids of their opponents. As a result, you' ll be asked to extensively analyse auctions using game theory. In this tutorial, you will use these tools to study a variety of auction formats: first and second-price auctions and all-pay auctions. Derive the game-theoretic predictions of how people should bid and test this by conduction auctions in the classroom

PROJECT: Project Presentation
You' ll finish with an exciting one day mini-conference! By working independently over the two-week period, you will spend the last day discussing your relevant findings on your assigned Capstone Project, as well as presenting this to your peers and tutor. The course finishes with a workshop and review session to discuss applying for economics and business and management degrees and subsequent career options.

Management

If you are an ambitious and business minded, this course is perfect for gaining an introduction into the study of management at university level, whilst also developing skills necessary for you to succeed in business. The programme is interactive, letting you explore captivating real-life case studies and reflecting upon the successes and failures of various businesses.
Expert MBA tutors provide you with a fascinating insight into a broad array of management topics, such as organisational behaviour and the management of organisations, as well as finance, strategy, marketing and leadership.

Key Benefits

- Learn about the business successes through the Harvard MBA case study method
- Delve into key management theories, and learn how to apply these in real life
- Research industries and businesses, and create an innovative business plan
- Experience authentic student life in University of Cambridge colleges
- Interactive learning in small groups (av: 1:7) from expert university tutors
- Meet other motivated high school students from all over the world

Example Modules
MODULE 1: Introduction To Management
You will explore the components, processes and objectives of management practice. Examine how policies, practices and systems influence employee behaviour, attitudes and performance, and the subsequent managerial tools that can be deployed. You will also be introduced to case studies as a method for testing management theory in practice.

MODULE 2: Strategic Marketing
You' ll consider the role of market intelligence, proposition development and brand strategy in the effort to meet and influence the needs of the market. The course will also allow you to look at other topics such as: The Marketing Mix, Market Intelligence and How to Develop a Brand.

MODULE 3: Competitive Advantage And Innovation
How do companies differentiate themselves and create value in competitive industries? You' ll explore how companies utilise innovation in order to remain competitive and consider both success and failure case studies. You will also be able to research and brainstorm innovative ideas alongside your peers!

PROJECT: Develop Your Own Case Study
Throughout the programme, you will have the opportunity to research your own case study – choosing a particular industry, company or business leader that interests you. During a one day mini-conference, you' ll share your findings with your class, and also learn from your fellow classmates.