

ETON SUMMER UNIVERSITY PREPARATION COURSES

Eton Summer University Preparation Courses (ESUPC) 2024

Are you in Year 12 and keen to attend a leading university?

Do you want to boost your skills beyond the curriculum and enhance your UCAS application? If so, you need to find out more about the Eton Summer University Preparation Courses.

What are the Eton Summer University Preparation Courses?

ESUPC are a new combination of non-residential subject based courses, with academic sessions taught by committed teachers, the majority of whom teach at Eton College, and a range of academic enrichment sessions aimed to assist the students with their imminent university applications.

The subject programs are enriching, intellectual, exciting and full of opportunities to gain new skills and exchange ideas together with like-minded young people.

How much does it cost?

The course is completely free and in exceptional circumstances, financial assistance may be provided to assist in the cost of travel.

How long are the courses?

The subject courses have different durations, ranging from 3 - 5 days and students will be able to attend one subject course at a time.

How do I apply?

To apply to ESUPC, please complete the online application form. The deadline for applications is 18 March 2024 Please note, only students in maintained schools are eligible. https://www.etoncollege.com/esupc/

Application Form - <u>https://forms.office.com/e/V0rNJ8Tgr8</u>



It is important that all applicants read the details of this document carefully before applying for a place on the Summer School.

ESUPC Key information

Date:	The courses will run from Monday 1 st July – Friday 12 th July 2024	
Times:	08.30 – 16.00 daily	
Attendees:	Maximum class capacity of 14 students, with up to 20 classes running simultaneously	
Catering:	A light breakfast, morning snack and lunch will be provided	
Teaching:	The majority of the teachers on the course teach at Eton College	

Subjects: Each student will follow an intensive, subject specific course (listed below). In addition, all students will attend a selection of university application enhancement sessions to assist with their university applications.

Attendance: To get the most out of your time on the course it is essential that your attendance is uninterrupted. Please note that permission to be absent is only granted by the Director of Summer Schools in exceptional circumstances.

Fee: There is no course cost for the students as all places have been subsidised by the College

School Student Nomination: Eton College aims to provide ESUPC for students who would not otherwise be able to attend a course or summer school such as this. Nominated students should be those who might profit from the independence and aspiration implicit in undertaking such a course.

The Time-Table

Morning

Students will be asked to arrive between 8.30 - 9.10 where a light, continental breakfast will be available. In the first half of the day, you will have two teaching sessions on your selected, specialist course. Each session will last 1 hour 30 minutes and will be followed by a refreshment break.

Lunch

Lunch is a chance to re-fuel and meet other students from outside your specialist course. Students eat in Bekynton, the College's central dining facility, where the majority of all dietary requirements can be met. A prayer room will be made available for the duration of the course.

Afternoon

The afternoon is split into two sections. First, there is a 1 hour university application enhancement session which will cover topics such as personal statement writing, interview technique etc. This will be followed by your third specialist teaching session of the day.

We need to warn you that we expect the course to make a real difference to you – which means that, like at university, you may be given independent study to get on with, following on from the issues raised and discussed in your taught specialist sessions.

Departure

You will be free to leave the course at 16.00 daily and will be asked to sign out from a central location in Eton.

THE SUBJECT COURSES

Our Eton Summer University Preparation Courses are designed to take students beyond the confines of the A level and IB syllabi; they create a space for intellectual inspiration, interest and challenge, and provide a taste of university life at an academic and social level. Please note, under-subscribed courses may be withdrawn.

You will see below that some courses have been repeated in the second week of the courses. This is where the course content remains the same, however we are offering multiple dates to enable as many students as possible an opportunity to attend a course.

Arabic – An Introduction to Arabic	1 – 5 July
Biology with Chemistry I	1 – 5 July
Biology with Chemistry II	8 – 12 July
Chemistry I	1 – 5 July
Chemistry II	8 – 12 July
Classics – The Classical World: An Introduction	1 – 4 July
Computer Science I – Machine Learning and Artificial Intelligence	1 – 5 July
Computer Science III – Machine Learning and Artificial Intelligence	8 – 12 July
Design – Engineering and Architectural Design	1 – 5 July
Economics I – Economics and the world!	1 – 5 July
Economics II – Economics and the world!	8 – 12 July
English I – Poetry Through the Ages	1 – 3 July
English II – Female characters in literature	1 – 5 July
English III – Female characters in literature	8 – 12 July
English IV – A short history of theatre	8 – 12 July
French – An introduction to French at University	1 – 5 July
Geography – Super-curricular Stretch	1 – 3 July
History – Historical Skills and Approaches	1 – 3 July
History of Art – An Introduction to History of Art	1 – 3 July
Mathematics I – Mathematical Excursions	1 – 5 July
Mathematics II – Mathematical Excursions	8 – 12 July
Physics I – Relativity, space and engineering science	1 – 5 July
Physics II – Rocket science	8 – 10 July
Politics – Getting to grips with political ideas and an introduction to US politics	1 – 5 July
Theology and Philosophy – Grappling with the Big Questions	1 – 5 July

ARABIC – An Introduction to Arabic

Monday 1 – Friday 5 July

Student outcomes:

- To be able to hold a basic conversation in Arabic, mentioning things like your name, age, where you're from and hobbies.
- To gain a deeper understanding of Arabic culture, and its links to religion.
- To widen awareness of current affairs in the Middle East.

The Middle East is rapidly becoming one of the most important regions in the world. It has given us so much already: algebra, chess, and the concept of a three-course meal to name a few! Looking at the present, politics, finance, diplomacy, intelligence, natural resources and sport are just a few of the sectors that are currently in dire need of English/Arabic speakers. Understanding the nuances of a vastly different culture is therefore becoming paramount. During this course, you will learn to hold a basic conversation in Arabic (Levantine), gain a much deeper understanding of the Arabic culture and to what extent it is linked to Islam, and learn more about current affairs in the Middle East. Arabic is offered as an *ab initio* course at most universities and so this will be an excellent way of familiarising yourself with the language and culture!

GCSE grade requirements: all students welcome to apply

BIOLOGY WITH CHEMISTRY

Biology with Chemistry I: Monday 1 – Friday 5 July Biology with Chemistry II: Monday 8 – Friday 12 July SUBJECT LEADERS – Dr Roderick Edmonds, David Brewis, David Nevin-Jones, Samuel Shields and Charlotte Knowles

Student outcomes:

- Explore the field of biology over a diverse range of topics within the study of living organisms.
- Expand and deepen your understanding of chemistry, and do some new experiments.
- Discover links between chemistry, biochemistry and medicine.

In biology, we will discover and investigate life on varying scales from cells and microbes to whole organism biology. You will have the opportunity to tie experiments to theory in a laboratory setting while you build your analytical skills and investigate the links between biology and medicine.

In chemistry, we will explore beyond the facts, and look for underlying principles which can be applied widely within and beyond the school syllabus. You will do some exciting experiments in inorganic and organic chemistry, including infrared spectroscopy. Those aspiring to medical school will see why chemistry is considered essential.

Students should only apply for this course if they are studying both Biology and Chemistry at A-Level.

GCSE grade requirements: 8 or above in biology and chemistry

CHEMISTRY

Chemistry I: Monday 1 – Friday 5 July Chemistry II: Monday 8 – Friday 12 July

Student outcomes:

- Gain an insight into what it is like to study chemistry at university.
- Delve beyond the syllabus into areas such as reaction mechanisms, stereochemistry, transition metal chemistry, and analytical techniques.
- Complete advanced practical work in our recently refurbished labs.

The focus here will not be on *what* happens in chemistry, but rather on *why* it happens, and how these underlying principles can be applied widely within and beyond the school syllabus. Examples will be drawn from topics across all areas of A level chemistry. You will do some exciting experiments in inorganic and organic chemistry, including infrared spectroscopy and gas chromatography.

We expect that many students who apply for this course will go on to study chemistry at university. If you are unsure about your university subject, or if you intend to read Natural Sciences, you could consider applying for one of the ESUPC combined science courses.

GCSE grade requirements: 8 or above in chemistry

SUBJECT LEADERS – Chris Smart and Harry Jones

CLASSICS – The Classical World: An Introduction

Monday 1 – Thursday 4 July

Student outcomes:

- Appreciate some of the richness of the ancient world
- Develop a fresh perspective on aspects of our modern world
- Open up avenues for further exploration of Classical ideas, culture and language

So much of the art, literature and architecture we encounter (not to mention a good proportion of the English language itself) grew out of a world steeped in Classical languages, values and understanding. These formed the foundation for education in this country until relatively recently; nowadays too few have the opportunity to explore these extraordinary cultures. In this course, we will seek to discover some of the ways in which our understanding of the world in 2024 can be enriched and deepened by an understanding of the Greek and Roman worlds. We will focus specifically on Greek tragedy, mythological characters, the birth of Western literature, Classical archaeology, history, artistic representation and some Latin and Greek that will already be familiar to many.

GCSE grade requirements: 6 or above in English

COMPUTER SCIENCE – Machine Learning and Artificial Intelligence

Computer Science I: Monday 1 – Friday 5 July Computer Science III: Monday 8 – Friday 12 July

Student outcomes:

- Technical knowledge of how neural networks and other machine learning systems function, including the underlying mathematics, as well as the history of their development.
- Practical experience with Python and JavaScript programming to train and use machine learning models, using a range of libraries and APIs.
- An appreciation for the ethical considerations and societal impact of continued AI adoption, to be as prepared as possible for an exciting, but uncertain, future.

Our modern, connected society has become closely intertwined with applications of artificial intelligence. Sometimes, these AIs are highly visible and used by choice, e.g. digital voice assistants, robots, self-driving cars, ChatGPT and other conversational AIs. Other times, the AIs are hidden from view and can affect people's lives without their knowledge, e.g. job recruitment, loan applications and other financial systems, social media and advertisements, security and, conversely, criminal activities. As things currently stand, the vast majority of the human population on Earth will not possess a robust understanding of how AI works. Those who do have the greatest chance to shape the future. Building on computer science and mathematical foundations, this practical course aims to show how AIs can be trained and deployed. We'll be based in a classroom equipped with Apple Mac computers and we'll explore a range of different AI use cases, including prediction and regression, classification, machine vision, natural language processing, and generative AI.

GCSE grade requirements: 8 or 9 in mathematics, 8 or 9 in computer science (although students studying A level computer science without a GCSE are welcome to apply).

SUBJECT LEADER – Marcus Phillips

DESIGN – Engineering and Architectural Design

Design I: Monday 1 – Friday 5 July

Student outcomes:

- Design, engineer and construct your own skyscraper.
- Learn manufacturing skills: 3D printing, laser cutting, sawing and drilling plus more.
- Create content for your design/engineering/architectural/creative portfolio.

In this course pupils will document their research around a brief, come up with ideas, develop ideas in 2D and 3D before building a sophisticated and detailed final model.

This course focuses on cutting-edge design technologies in contemporary architecture, including 3D printing, laser cutting, and use of CAD software. Students will gain hands-on experience in creating scale architectural models using a blend of digital and traditional techniques in our state-of-the-art workshops.

Emphasis is placed on integrating various tools to streamline the design process and enhance creativity. The curriculum covers prototyping with a range of materials, engaging in iterative design and incorporating card mock-ups for rapid iteration; pupils will also learn traditional sketching techniques. Students will learn to create a visually appealing portfolio, preparing them for university applications in architecture, design and engineering.

GCSE grade requirements: all students welcome to apply

ECONOMICS – Economics and the world!

Economics I: Monday 1 – Friday 5 July Economics II: Monday 8 – Friday 12 July

Student outcomes:

- Improve your analysis skills by tackling problems with real world application
- Develop debating skills and how you present arguments
- Advance economic knowledge with reference to other academic disciplines

The Economics Course will cover several aspects of Economics both within and outside of the curriculum. We will have sessions on public policy, political economy, the philosophy of economics, deglobalisation and inequality. Students will be challenged with up-to-date concepts and theories relevant to the study of economics in contemporary universities. All students with an interest in studying economics or related courses at university are welcome, however, it is preferred if they are studying an A-Level in Mathematics. Content covered:

- Public policy
- Political economy
- Philosophy of economics
- Deglobalisation
- Inequality
- Other key topics in Economics

GCSE grade requirements: 7 or above in English and mathematics

SUBJECT LEADERS – Jonathan Newton and Oshanthaka Cabraal

ENGLISH – Poetry Through the Ages

English I (Pre and Post 1900): Monday 1 – Wednesday 3 July

Student outcomes:

- To appreciate the richness of English poetry
- To gain awareness of the evolution of poetic forms and consistency of themes
- To develop a more informed worldview with a deeper understanding of cultural politics

Poetry is a form of expression that allows us to communicate our thoughts and feelings. Although poetry has evolved over many centuries, exploration of key themes in poetry suggests universal human experiences across different cultures and ages. In this course, we will discuss poetry from the 16th to the 21st century across different geographical locations and schools of poetry. It will allow you to evaluate and discuss a wide range of poems under common themes such as love and marriage, oppression and death, and gender and sexual identities. Through student-led discussions you will develop an understanding of how poetry has structurally and linguistically evolved over the years and across different regions, while remaining a prominent form to express human experiences.

GCSE grade requirements: 6 or above in English

ENGLISH – Female characters in literature

English II: Monday 1 – Friday 5 July English III: Monday 8 – Friday 12 July

Student outcomes:

- Develop an understanding female characters in literature
- Open up ideas about wider social issues represented in novels with prominent female characters
- Explore the development of female characters through the years

The majority of prominent characters in literature are male characters (think of Othello, Mr Darcy, Harry Potter). In this course, we will explore prominent female characters in literature ranging from Hermione Granger to Bridget Jones to Kya Clark. We will seek to understand how female characters are represented and how this shapes our understanding of the role of women in modern society. We will seek to discover how our understanding of female characters has changed over the decades and how this is impacted by sociological concepts.

GCSE grade requirements: 6 or above in English

ENGLISH – A short history of theatre

English IV: Monday 8 - Friday 12 July

Student outcomes:

- Provide an overview of the evolutions in dramatic form
- Understand how playwrights have manipulated classic dramatic principles to suit their own ends
- Provide an insight into plays and playwrights that students may not have encountered before

This course is an introductory course, designed to provide an overview to the major periods of English and European Theatre. Beginning with theatre's classical origins, the course will track the rise of the Elizabethan Playhouse, taking students beyond the world of Shakespeare into other, lesser known 16th and 17th century playwrights. From there, we will investigate the birth of naturalism through Ibsen and Chekov, and the seismic changes to the form that occurred in the 20th century.

GCSE grade requirements: 6 or above in English

SUBJECT LEADER – Jeanne-Marie Dano

FRENCH – An introduction to French at University

Monday 1 – Friday 5 July

Student outcomes:

- Getting a better understanding of French culture in all its singularity
- Improve and develop fluency in French
- Consolidating grammatical foundations to reinforce your written French

This preparatory course is aimed at all students interested in reading French (on its own or as part of a

SUBJECT LEADER – Charlie Roger

joint-honours degree) at a top university in the UK or the US. All students attending will get an opportunity to consolidate their grammatical foundations and have an in-depth understanding of some of the more challenging concepts of the French language. The real focus of the course, however, will be on French and Francophone cultures, which will be approached from a variety of angles and media. Through seminar-like discussions of poems, short stories, films, series, songs etc. students will be encouraged to think independently and gain an appreciation of the breadth and complexity of the Francophone world. A pre-existing interest in literature, cinema, history and the history of ideas would therefore be advisable. By the end of this course, students should be in a strong position to apply wherever they may please.

GCSE grade requirements: all students welcome to apply

GEOGRAPHY – Super-curricular Stretch

Monday 1 – Wednesday 3 July

Student outcomes:

- Appreciate the breadth of the subject at university level.
- Understand the importance of critical analysis and different ways of viewing the same material.
- Draw connections between different topics, and links with other subjects.

Geography draws on numerous aspects of the physical and human world to help provide a holistic, joinedup understanding of the patterns and process that shape our lives, and our planet. In this course we will discover a greater range, depth, and diversity of the subject than typically covered in the sixth-form, to gain a better picture of the breadth and opportunity at university level. There will be a mixture of seminars, reading and writing workshops, and local excursions.

GCSE grade requirements: 7 or above in Geography

SUBJECT LEADER – Joanna Rainey

HISTORY – Historical Skills and Approaches

Monday 1 – Wednesday 3 July

Student outcomes:

- Explore historical schools of thought, including strengths and limitations
- Develop a broader understanding of the discipline of History
- Experience the role of historians including handling of sources and material culture

Are you fascinated by the 'discipline' of history, the forms and schools of thought? This course will explore how historians *do* history: how they deal with sources, how they use material culture (including objects) to understand past societies and how they write history (including popular and historical fiction). We will explore traditional schools of thought, from the Annales School to Microhistory, and visit a range of historical periods from 15th Century Florence to 19th Century China. This course will include visits to College Library, the Museum of Eton Life and the Museum of Antiquities'.

GCSE grade requirements: 6 or above in English and/or history

HISTORY OF ART- An Introduction to History of Art

Monday 1 – Wednesday 3 July

Student outcomes:

- Develop an understanding of the discipline of History of Art at university.
- Explore how visual language is used by artists to communicate ideas and develop knowledge of key historical terms, concepts and issues.
- Gain perspective of the role of the curator through the first-hand study of objects and artworks in the Eton College Collections.

This introductory course is concerned with studying the visual qualities, making and interpretation of examples of European painting, sculpture and architecture. You will learn how to analyse the composition of a work of art using art historical terminology and take a close and critical look at some of the 'movements' and 'isms' by which the history of Western art has been conventionally structured. We will discuss the contexts of these movements and debate the problems inherent in the process of canonisation. Some of the sessions will take place in front of objects and artworks from the Eton College Collections, enabling us to discuss what can be learnt from looking at an original work of art rather than a reproduction.

GCSE grade requirements: all students welcome to apply

MATHEMATICS – Mathematical Excursions

Mathematics I: Monday 1 – Friday 5 July Mathematics II: Monday 8 – Friday 12 July

Student outcomes

- Stretch current knowledge
- Explore some concepts beyond the syllabus
- Introduction to Oxbridge preparation

The pure mathematics topics will look at a number of extension topics including:

First principles differentiation with a focus on fractional and negative indices, extending to trigonometric and exponential functions.

Mathematics for computer science interview preparation including colouring, pigeonhole, invariance, counting and recurrence principles; which are extension topics often explored in interview questions. Time permitting, other extension topics may include curve sketching, integration using reduction formula, and a look at some MAT and STEP questions.

The applied mathematics topics will include:

Collisions: introduce the concept of coefficient of restitution for collisions (including special cases when e=1 and e=0), apply the conservation of momentum, and when appropriate, the conservation of energy, to collisions, and extending to questions involving successive impacts (and if time permits, oblique impacts).

Moments: understand and use moments in simple static contexts, finding centre of mass in non-uniform bodies, analyse equilibria of rigid bodies, including bodies in contact, and on breaking of equilibrium, for example by toppling or slipping.

Time permitting, another extension topic may include work energy power: explore the concepts of

SUBJECT LEADERS – Dr Justin Moston and Tina Wang energy (kinetic and potential), work, and power, applying the work-energy principle and conservation of energy in a variety of contexts.

GCSE grade requirements: 9 in mathematics and ideally taking Further Mathematics at A level. Ideally applying to university to read mathematics or a related discipline (e.g. computer science or maths + something).

PHYSICS – Relativity, space and engineering science

SUBJECT LEADERS – George Gundle, Dr Philippa Mackie and Jack Turley

Physics I: Monday 1 – Friday 5 July

Student outcomes

- Discover fascinating areas of modern physics, including special relativity and general relativity
- Improve your problem-solving skills by tackling questions with real world applications to engineering
- Develop practical, data analysis and IT skills during the space science project

The physics course has three strands: an introduction to relativity, a taster of university engineering and hands-on work programming an Arduino module. Each strand will build on students' existing knowledge to give a feel of what physics is like at university and develop the keys skills needed to succeed in the subject. Problem solving, both practical and theoretical, will feature heavily and students should be prepared to think hard about some challenging concepts. The reward at the end of the five-day course will be a deep understanding of ideas like time dilation and spacetime, the inner workings of motorbike and the challenges facing humanity as we look to explore space.

GCSE grade requirements: 8 or 9 in physics and 8 or 9 in mathematics

SUBJECT LEADER – Henry Clarke

PHYSICS – Rocket science

Physics II: Monday 8 – Wednesday 10 July

Student outcomes

- Learn to apply existing physics knowledge to a novel situation
- Extend knowledge and understanding of thermodynamics
- Learn to create computer based mathematical models that allow both predictions and explanations of physical phenomena
- Develop practical, data analysis and IT skills

In this project, A-level students will use physics to understand and explain what is going on during the launch of a compressed air and water powered rocket and use this knowledge and understanding to build a mathematical model that predicts the maximum velocity (and therefore the height) that the rocket payload will achieve during the launch.

Students will launch rockets, videoing the launch on their mobile phones. They will then quickly, easily and accurately analyse the footage using motion tracking software. The data generated will then be copied into a spreadsheet and analysed further. Students will then be encouraged to think about the physics, reading some relevant material, watching some short video clips and answering questions that

will help to develop their understanding.

They will then be guided through the process of building a mathematical model using the physics that they have learned to make a step-by-step prediction of the motion of the rocket. Having built the model they will then check how well it fits the experimental data from their initial rocket launch. Finally they will then use the model to investigate what changes to make to maximise launch velocity, conducting further rocket launches and analysing them to see how closely the predictions generated by the model fit with real experimental data when various parameters (e.g. water fill level or payload size) are changed.

GCSE grade requirements: 8 or 9 in physics and 8 or 9 in mathematics

SUBJECT LEADERS – Dr Luke Purshouse and Deborah Bahr

POLITICS – Getting to grips with political ideas and an introduction to US politics Monday 1 – Friday 5 July

Student outcomes:

- Develop insight into the key institutions and processes of American government and politics
- Deepen understanding of political ideas, ideological perspectives and the debates surrounding them
- Critical engagement with a range of texts, media sources and debates
- Extension/enrichment for students studying A-Level Politics, or considering applying to read a Politics-related course at university

Using contemporary US political affairs as a starting point, students will consider the nature of democracy in America and the challenges it faces. They will consider a range of sources, from US news coverage, to extracts from films and documentaries, to the Constitution itself. Major topics will include: fundamentals of US government; US political parties; presidential and congressional elections; Congress (the 'Broken Branch?') and the politicization of the Supreme Court.

The theory section of the course will take an in-depth look at political concepts and the competing ideological perspectives built around them. It will engage with primary texts as well and a number of classic and contemporary debates within political philosophy. Major topics will include: social justice and equality; the nature and value of freedom; democracy and its critics; the nation and other forms of community; perspectives on ecology; forms of feminism and an introduction to international relations theory.

GCSE grade requirements: no formal requirements, but 7 or above in English is likely to be helpful

THEOLOGY AND PHILOSOPHY - Grappling with the Big Questions

Monday 1 – Friday 5 July

Student outcomes:

By the end of this course all students will have:

- Explored the problem of evil and suffering through the historical lens of the Rwandan genocide
- Analysed the development of the Reformation as a theological movement in Europe and in England in the late sixteenth century
- Read a philosophical text (Berkeley's *Dialogues*) and learned about key questions in epistemology and metaphysics
- Critically engaged with the methods and approaches of Global Philosophy and considered how we can fruitfully bring into dialogue the world's major philosophical traditions

This course is comprised of 3 modules in Theology and Philosophy. Each module will run throughout the week for 1.5h each day, led by a different teacher. The course therefore offers breadth and depth for students considering Theology/Religious Studies/Philosophy at university. You will study:

- i. *The Problem of Evil and the Reformation*: this module focuses on the doctrine of a benevolent God and why a just God allows evil to occur. We will also analyse the theological questions and issues behind the 16th century European and English Reformation.
- ii. 'To be is to be perceived': Reading Berkeley's Three Dialogues: this module will introduce you to some key ideas in epistemology (how and what we know) and metaphysics (what exists), as well as give you the opportunity to read a classic philosophical text closely.
- iii. *Global Philosophy:* this module will explore the major themes and methods of Global Philosophy, and introduce students to the world's major philosophical traditions (including the Arabic, Chinese, and Indian traditions).

GCSE grade requirements: all students welcome to apply – though a genuine interest in Theology and/or Philosophy, and a willingness to participate actively in discussion are important.

APPLICATION

Please complete the application form by the **18th March 2024**

Application Form - https://forms.office.com/e/V0rNJ8Tgr8

Unfortunately, we will be unable to accept any applications received after the applications deadline.

Applicants and their schools will be notified by the 25th April as to whether or not they have gained a place on the Courses. Following which, details of all relevant arrangements will be forwarded.

More information can be found on our website: <u>https://www.etoncollege.com/esupc/</u> Email address: <u>esupc@etoncollege.org.uk</u>



