



Course Options

2019

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Introduction

At the Oxford Summer Academy, we offer 2 types of programmes:

- **Career focused options:** Courses aimed to give students a better idea of what a career in their chosen profession would look like. For each 2 week course the student attends, they select the career path/university course they are interested in.
- **Academic focused options:** Courses to help students explore subjects they are interested beyond the usual school curriculum, or to try something new, perhaps a subject they are considering studying at university. For each 2 week course the student attends, they study **1 major, 1 minor and 1 elective course**. Students can pick any combination of courses from those listed. We will ask students to select a first and second choice for their major, minor and elective courses, in case their first choice course is no longer available.

Students can attend for 2 or 4 weeks, and can combine any of the above courses in to a 4 week course.

Career Focused Options

Young Doctor

Making the decision to study medicine not one that is taken lightly, and making sure it is the right option for a student is hugely important. The amount of time spent training, and the associated financial costs can be worth it to reach such an incredibly rewarding career as a doctor – as long as it truly is the right career for them. This can be hard to judge at such a young age, as students have often had little or no real insight in to what the medical course is like or what it is like to be a doctor. This is where our course can help. OSA's Young Doctor programme is specially designed to give students a much better understanding of the life of a doctor – incorporating academic theory, workshops, seminars and practical elements. The University of Oxford is one of the centres of excellence for medicine in the UK and spending two weeks here will enhance any medical school application. As part of the course, we also help students write their competitive university application, and prepare for the UKCAT and BMAT. This course has been developed by award-winning educationalist, Yasmin Sarwar, who in the last 10 years has secured more than 200 places for international students at medical schools, including Oxford, Cambridge, UCL and Imperial. The programme concludes with a mock MMI session – similar to that used by many Russell Group universities when

selecting medicine candidates. For any student considering studying medicine, this course can help show what it's really like being a doctor, helping them gain confidence that continuing along this path would be the right one.

This course fills the 2 week period, so students do not need to pick any further courses to take while at the Oxford Summer Academy.

Young Executive

One of the University of Oxford's newest projects has been to open The Foundry – a dedicated space for students to pursue business and entrepreneurial ideas. Innovation and business in Oxford is thriving; so, what better way for students to hone their skills in this area than by coming to OSA's dedicated two-week Young Executive programme? Students will not only get a crash course in business theory – including profit and loss accounting, marketing, ideas generation as well as an insight into HR management, but they will also learn how to create a business plan. Students will look at the changing nature of the workplace and how working environments have dramatically shifted in the past 20 years. Our partner organisation, Future Considerations (a business management consultancy) will be delivering a number of the workshops. The end of the course culminates in a business pitch judged by real industry experts, which could potentially receive actual financial investment from them.

This course fills the 2 week period, so students do not need to pick any further courses to take while at the Oxford Summer Academy.

Young Engineer

This two-week programme focuses on some of the key academic knowledge needed to make a successful engineering application to a top university and then combines it with in visits to some of Oxford's top engineering firms. Oxford is the home of two universities both with excellent engineering departments and facilities, including Oxford Brookes' Formula 1 testing lab, and it also houses BMW's manufacturing plant, where over 3 million Minis have been built, and students will get to visit both of these places. The programme will also spend time looking at different types of engineering, such as mechanical, civil and aeronautical. Having access to tutors and researchers from the two universities which are at the cutting edge of the engineering world (the main F1 teams all have a Brookes graduate) makes this programme ideal for those interested in this career pathway. The programme concludes with a space design competition judged to NASA standards with experts providing analysis and advice.

This course fills the 2 week period, so students do not need to pick any further courses to take while at the Oxford Summer Academy.

Young Lawyer

Studying for a degree in law opens up many different and varied roles to pursue, and this course aims to introduce students to some legal knowledge as well as what these different career paths are that will be open to them. This two-week programme focuses on all aspects of going into the legal profession – whether you want to be a solicitor, barrister, or perhaps even a constitutional lawyer – the programme looks at them all. The course will include academic legal theory, along with case analysis of both criminal and civil cases. Students will also get to see the law in action by visiting Oxford Crown Court, and by speaking to a solicitor to get a feel for the day-to-day operations. The programme concludes with a mock trial competition which helps students understand the workings of a court and improves their oratory and presentation skills. Students will also learn to examine and cross-examine witnesses.

This course fills the 2 week period, so students do not need to pick any further courses to take while at the Oxford Summer Academy.

Academic Focused Options

Mathematics

Major: Mathematics - Functions

- Prerequisites: Some experience with algebra, for example, polynomials, linear and quadratic equations and inequalities.
- Broad Aims: This course develops students' understanding of functions and provides a strong foundation for the study of calculus.
- Detailed Objectives: Students are encouraged to develop problem-solving skills and in particular, familiarity with functions and their properties.
- Summary of Syllabus: Co-ordinate Geometry; Euclidean Geometry; Solving Triangles with Laws of sines and cosines; Radians; the concept of a function and its graph; the domain and range of a function; composite functions and inverse functions; examples of functions e.g. Quadratic, cubic, exponential, logarithmic, trigonometric; curve sketching of rational functions; the modulus function; complex numbers; the Binomial Theorem.

No. of hours tuition: 16 hours

Minor: Mathematics – Applied Probability

Prerequisites: None

Broad Aims: This course aims to introduce students to key concepts in probability and begin to consider how ideas from probability can influence decisions on likelihood in the broader world.

Detailed Objectives: Students will develop understanding of concepts in probability and the ability to solve problems. The course will emphasise how to tackle problems involving conditional probability and the use of tree diagrams.

Summary of Syllabus: Elementary Probability: definitions, formulae, tree diagrams; conditional probability; the binomial distribution.

No. of hours tuition: 8 hours

Computing

Major: Device Programming and the Internet of Things (IoT)

Prerequisites: You will need some skills in logical thinking, an interest in learning about new technology and a “how does that work?” mindset. Previous experience of programming will be helpful but is not necessary, come and discover for yourself! You will need to bring a laptop and your smartphone.

Broad aims: This course is a hands-on practical activity in which you will discover how to program devices that can connect to and be controlled from the Internet. Recent developments in technology means that it is now much simpler to create web aware devices for home automation and environmental monitoring the IoT is expected to grow to 30 billion devices by 2020.

The course will be taught by a practising Chartered Engineer who is developing commercial projects using these devices.

Detailed objectives: We will look at the Arduino and the ESP8266 devices and see how they can be programmed to sense the environment around them and to distribute that information to the web. We achieve this by working through a series of programming challenges.

Summary of syllabus: Introduction to embedded computer systems and device programming. The IoT, what it is and why its significant.

Arduino: Overview of the device and its programming environment (IDE). Controlling LEDs to make light patterns and outputs more generally. Reading inputs from sensors. Using a shield board to add Internet awareness.

ESP8266: Overview of the device and how to program it using the Arduino IDE. The ESP programming model. Implementing a basic web server. Connecting to the web and transferring information to and from web pages.

No. of Tuition hours: 16

Minor: Minor: Device Programming and the Internet of Things (IoT)

Prerequisites: You will need some skills in logical thinking, an interest in learning about new technology and a “how does that work?” mindset. Previous experience of programming will be helpful but is not necessary, come and discover for yourself! You will need to bring a laptop and your smartphone.

Broad Aims: This course is a hands-on practical activity in which you will discover how to program devices that can connect to and be controlled from the Internet. Recent developments in technology means that it is now much simpler to create web aware devices for home automation and environmental monitoring the IoT is expected to grow to 30 billion devices by 2020.
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Summary of Syllabus: Introduction to embedded computer systems and device programming. The IoT, what it is and why it is significant.

Arduino: Overview of the device and its programming environment (IDE). Controlling LEDs to make light patterns and outputs more generally. Reading inputs from sensors. Using a shield board to add Internet awareness.

ESP8266: Overview of the device and how to program it using the Arduino IDE. A simple ESP application. Demonstration of an ESP based device.

No. of hours tuition: 8 hours

Literature

Major: Shakespeare and Friends

Prerequisites: None compulsory – but some knowledge of at least one or two Shakespeare plays would be useful.

Broad aims: To understand Shakespeare in the literary context in which he was writing, as well as to appreciate the vibrant and exciting scope of Renaissance literature beyond the bard. The course should inform work on Shakespeare and other writers in school, further study and for personal enjoyment.

Detailed objectives: Students will gain a broad overview of both Shakespeare's writing and the work of other key London writers at the end of the sixteenth and start of the seventeenth centuries. The course will see Shakespeare as a man of his time, writing in a fiercely competitive literary and theatrical market place. Students will be asked to critically evaluate Shakespeare's status among modern audiences and ask whether any of his contemporaries deserve the same level of critical attention, historical and popular affection that we give Shakespeare today.

Summary of syllabus: Shakespeare's work will be considered alongside extracts from relevant contemporary writers. These may include Shakespeare's rivals in London's theatres, Marlowe, Kyd, Webster and Jonson; his famous collaborators, Middleton and Fletcher; as well as work on which Shakespeare is thought to have collaborated, such as *Arden of Faversham*. Other writers from the same literary culture may also be considered such as the poet Mary Sidney, satirist Thomas Nashe and Shakespeare's clown Will Kempe.

No. of Tuition hours: 16

Minor: Perspectives on Poetry

Prerequisites: A keen interest in all types of poetry and the willingness to learn and apply techniques of literary criticism and appreciation to the material studied on the course.

Broad Aims: To broaden your understanding and enjoyment of a wide variety of poetry.

Detailed Objectives: To equip you with the skills and confidence needed to analyse and evaluate with conviction the work of an eclectic mix of poets and poetic forms. The material studied may include selections from the Romantics, war poetry and the works of T.S. Eliot, W.B. Yeats, W.H. Auden, Roy Campbell, Ted Hughes and Seamus Heaney.

Clarity of thought and expression, coupled with fluent and cogent argument, are highly prized attributes at university, and this course aims to ensure that you will both acquire and readily demonstrate them when the need arises.

Summary of Syllabus: Close study, critical examination, analysis and evaluation of poetic form, content and meaning. Particular attention will be given to detailed exploration of authorial intentions, the techniques employed and the degree of success attained in achieving them.

No. of hours tuition: 8

Social Sciences

Major: Psychology – Inside the Human Mind

Prerequisites: None

Broad Aims: How we think, interpret and experience the world around us has been delighting and frustrating psychologists for over 100 years. This course introduces you to a wide range of psychological approaches, including Psychodynamic, Behavioural, Cognitive and Biological psychologies. All of which seek to explain the diversity of human behaviour. We will examine areas such as memory, individual differences including psychopathology, social influence and stress. This course aims to give you a general overview of the subject.

Detailed Objectives:

- 1) To give students an introduction to the development of psychological theories and their associated methodologies.
- 2) To provide a broad understanding of the key approaches in Psychology.
- 3) To develop an awareness of the ethics and debates of current psychological research

Summary of Syllabus:

- An overview of the development of psychological thought over the past 100 years and its associated methodological changes.
- An introduction to Psychodynamic, Behavioural, Cognitive and Biological Psychologies
- Aspects of psychopathology
- A general understanding of the tensions that exist between the various approaches in modern psychology.

No. of hours tuition: 16 hours

Minor: Psychology - Crime & Punishment

Prerequisites: None

Broad Aims: Why do some people turn to a life of crime? Do we always convict the right guy? And when, if ever, should we lock them up and throw away the key? This course will explore Psychology's contributions to such questions, with some surprising answers...

This course will provide an overview of psychological research into Crime and Punishment, demonstrating how a scientific understanding of the causes of human behaviour can improve all aspects of criminal justice. Considering the different stages of the process of criminal behaviour and justice will facilitate introduction to the assumptions and methodologies of different branches of Psychology.

Detailed Objectives:

- 1) To develop an understanding of the complexity involved in identifying the causes of human behaviour
- 2) To develop an awareness of the issues surrounding how we treat suspects, witnesses, jury members, and prisoners
- 3) To know how the different branches of scientific psychology operate, and the types of evidence they use
- 4) To be able to critically evaluate psychological studies, explaining how their strengths and weaknesses influence their value for influencing policy

Summary of Syllabus:

- "My genes made me do it!": determinants of behaviour and 'Nature vs Nurture' (*Biological Psychology and Social Learning*)
- Criminal Thinking Patterns and the Development of Morality (*Individual Differences, Psychopathology, and Developmental Psychology*)
- Psychology in the Courtroom: 'Flashbulb memories', the Reliability of Eye-witness Testimony, and the Psychology of Persuasion (*Cognitive Psychology*)
- Offender Punishment and Rehabilitation: What works and why? (*Cognitive Behavioural Therapy, Learning Theory*)

No. of hours tuition: 8 hours

Major & Minor combined: PPE (Politics, Philosophy & Economics)

- Prerequisites:** An interest in studying PPE at university.
- Broad Aims:** To provide an introduction to “Philosophy, Politics and Economics” (PPE), following the model of the University of Oxford University’s PPE course.
- Give students an understanding of what studying these three subjects in combination would be like at a top UK university.
- Complete a project that brings elements of all three subjects together.
- Detailed Objectives:** The aim of the philosophy course is to give students the opportunity to think about the wider questions and particularly look at two of the key philosophical texts needed at undergraduate level – The Social Contract and Utilitarianism. Students also get a chance to hone their logic skills by doing some basic first year undergraduate propositional logic.
- The aim of the Politics part of the course is to start by looking at what democracy is all about and then taking time to look at how two different democracies run differently. The British and American political systems will be compared to see how the same principle can be applied very differently.
- The purpose of the Economics strand of the course is to introduce students to elements of both micro and macro Economics needed to understand how and why governments intervene in an economy.

Summary of Syllabus:

- Introduction to basic logic
- Introduction to The Social Contract by Rousseau
- An Introduction to Utilitarianism (Mill and others)
- What is Democracy?
- The British Political System – A Parliament with a Prime Minister
- The American Political System – A President and Congress
- Microeconomics – free markets vs market failure. How and why do markets work and importantly why they might fail? And when they do fail what the government can do about
- Macroeconomics – An introduction to how governments operate – fiscal, monetary and supply-side policies.
- Project

No. of hours tuition: 24 hours

Minor: Economic Curiosities

- Prerequisites:** None. The material delivered will be non-technical and no prior knowledge of Economics or Economic History will be assumed. All that is required is a curious mind!

Broad Aims:	To introduce some of the most important concepts, models and theories involved in Economics in an accessible and engaging way.
Detailed Objectives:	<p>Using accessible and enjoyable popular Economics texts as a starting point, this course aims to provide participants with an insight into how Economics can be used to shed light on many areas of life, including some that might be surprising.</p> <p>Students will be encouraged to read and think critically and reflectively – skills that are essential to the study of Economics and many other academic disciplines.</p> <p>Topics such as opportunity cost, comparative advantage, the role of incentives and moral hazard will provide a valuable grounding for anyone studying or planning to study Economics, as well as providing useful tools for thinking about everyday issues for the non-economist.</p>
Syllabus:	<p>Topics will be taken from the following books/papers:</p> <ul style="list-style-type: none">• The Undercover Economist by Tim Harford• Freakonomics by Steven D. Levitt and Stephen J. Dubner• Nudge by Richard H Thaler, Cass R Sunstein• Thinking, Fast and Slow by Daniel Kahneman• The Armchair Economist by Steven E. Landsburg• Superfreakonomics by Steven D. Levitt and Stephen J. Dubner• The Biggest Auction Ever by Ken Binmore and Paul Klemperer• Do Economists Recognize an Opportunity Cost When They See One? by Paul Ferraro and Laura Taylor• Animal Spirits by George A. Akerlof and Robert J. Shiller <p>Examples of questions considered are:</p> <p>How can your name affect how well you do in life?; Who really makes money from fair trade coffee?; How do you get twenty-two and a half billion pounds from selling air?; Are people hard-wired for altruism or selfishness?; Why do we assume a good-looking person will be more competent?</p>
No. of hours tuition:	8

Humanities

Major or Minor: Critical Thinking – The Art of Reasoning

Prerequisites:	None
Broad Aims:	Critical thinking will help you succeed no matter what subject you hope to study at university. This course will improve your ability to conduct debates in class, evaluate others' arguments, and create your own persuasive arguments.

- Detailed Objectives: This course will enable you to identify, evaluate, and construct arguments in spoken and written forms, recognise false reasoning and use language to express and influence an argument. After this course you should be able to recognise biases and ambiguous language, base judgments on evidence, and approach topics and problems from various angles.
- Summary of Syllabus: Over the course of the fortnight we will examine five topics: what is an argument? Inductive and deductive reasoning, supportive sources, language use, and awareness of bias. The coursework will focus on defining statements, premises and conclusions, and understanding ambiguous and vague language.
- No. of hours tuition: 16 hours as Major option; 8 hours as Minor option

Minor: Philosophy - What is a Good Life?

- Prerequisites: None
- Broad Aims: This course considers nine great thinkers' ideas on what constitutes human happiness and how best to go about attaining it. Considering their arguments will familiarize the student with the central themes of Western philosophy, and develop the ability to assess and construct arguments.
- Detailed Objectives: At the end of this course the student will be able to:
- Use philosophical terminology correctly
 - Refer to notable philosophers and their ideas
 - Identify several schools of thought on the meaning of life
 - Summary of Syllabus: Over the two weeks the class will examine extracts from these nine works:
 - Plato The Republic
 - Aristotle The Nicomachaen Ethics
 - Jean-Jaques Rousseau The Social Contract
 - Hobbes Of Man
 - Schopenhauer On the Suffering of the World
 - Nietzsche Thus Spake Zarathustra
 - Marx The German Ideology
 - Freud Civilization and its Discontents
 - Sartre Being and Nothingness
- No. of hours tuition: 8 hours

Electives

Elective: Public Speaking & Debate

Oxford has a long tradition of debate - many UK and US politicians learnt their public speaking skills in the Oxford Union. Students will gain confidence and competence in constructing, rebutting and presenting arguments. Based on a proposition that the students decide themselves, a debate is conducted in front of all the students, and a vote taken, to decide the winning team.

Elective: Profile Your Personality

On this journey of self-discovery, students will take numerous quizzes and tests to uncover different aspects of their personality. These results will be explored further to help students identify their strengths and to learn how to overcome their weaknesses. In addition to their own self-awareness, students will gain an appreciation of other people's personalities, and how they can best work alongside them.

Elective: Creative Writing

The skills of writing prose, poetry and journalism are developed as students create content for the Oxford Summer Academy Magazine. This will be distributed to all students at the course end, as well as published.

Elective: Photography

The beautiful architecture, cityscapes and landscapes of Oxford will be used in this elective. Each afternoon, students visit a different Oxford location and build a portfolio of work. At the end of the course, an exhibition of students' work is mounted. Images also contribute to the Academy Magazine.



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