



Summer Institute 2020 - Online Programme -



2020 Summer Institute here at Oriel College Oxford (Online Programme)

Programme Overview

I. Introduction & Background

Oriel College, Oxford

Oriel College is the fifth oldest college of the University of Oxford, founded in 1326. Situated in the heart of Oxford, Oriel College is home to around 300 undergraduate and 200 postgraduate students, as well as around 100 members of academic staff. The majority of Oriel's buildings date back to the 17th century and include: the Chapel, Pantin Library, Senior Library, and Hall. The College prides itself in being a welcoming academic community and home to world-class teaching, learning and research.

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Summer Institute here at Oriel College (Online Programme)

Summer Institute here at Oriel College Oxford (Online Programme) is an exclusive live online study abroad programme offered by Oriel College (University of Oxford, UK) in partnership with Worldstrides|CBL International. It offers a wide range of courses on a variety of subjects, such as: International Law, International Economics and Business, PPE and International Relations, English Literature and History, STEEM.

The *Summer Institute* cooperates with numerous world-renowned faculty, including current lecturers, researchers and tutors affiliated with the University of Oxford and the University of Cambridge.

II. Course details

Online Programme Dates:

Session 1: 19th July to 1st August 2020

Session 2: 2nd August to 15th August 2020

Each course at *Summer Institute here at Oriel College (Online Programme)* is five days long and includes 3 hours of live teaching a day (3 x 60 min) from Monday to Thursday as well as assessment and a live group discussion on Friday. Participants will have a unique opportunity to interact live with the lecturer from the University of Oxford or Cambridge as well as with their classmates from around the world.

Each week's course is designed to be equivalent to 2 - 3 ECTS credits or 1 - 1.5 US credits. At the end of the course there will be an official assessment (either a test or a presentation) to check learning outcomes. Upon a successful completion of the course delegates will be awarded with a Certificate of Attendance and an Academic Transcript, both issued by Oriel College, Oxford.

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Advantages of the *Summer Institute here at Oriel College (Online Programme):*

- Delegates can attend live courses from anywhere around the world.
- All classes will be recorded: participants will be able to watch the video as many times as they wish.
- It offers personalized learning fully adjusted to individual learning skills and pace, e.g. participants can pause the video to look up key vocabulary or concepts to ensure full understanding.
- Delegates will be able to interact live with the lecturer and with their classmates to enhance the learning process.
- Participants will have a chance to interact with their classmates and make new international friends.
- It gives an authentic experience of studying at the University of Oxford, UK.
- Having completed their course, participants will receive a Certificate of Attendance and an Academic Transcript issued by Oriel College, with 2 - 3 ECTS credits (1 - 1.5 US credits).

Course Options:

** All course topics are subject to availability of the faculty and Oriel College would be happy to offer other course topics upon the request from The Open University of Hong Kong.*

The course offerings include the following subjects from five academic tracks:

International and English Law

Legal (and Socio-Legal) Theory & Intellectual Property Rights

This course is comprised of two courses combining two facets of the law.

a. The legal theory course will provide an in-depth knowledge of the functions of the rule of law in common law jurisdictions, as well as to consider law in a practical manner. These lectures analyse the nature and importance of rules in legal systems and examine some of the main difficulties associated with the implementation of laws, rules, and regulations.

b. The course in intellectual property law aims to give students a general overview in partnership with:





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of the three main regimes of IP, copyright, patents and trademarks. This will include discussions on the justifications of intellectual property; the requirements necessary to garner protection for literary or artistic works, inventions and brand logos; the infringement of these various rights; and the remedies available.

United Kingdom Corporate Law

This course aims to introduce students to the subject of UK Company & Corporate Law. Students will participate in lectures covering the legal topics of companies operating in the United Kingdom. The course will discuss the different kinds of partnerships, the differences between private and public, limited and unlimited companies, as well as liability and insolvency issues. Through theoretical concepts, students will have the opportunity to analyse legal cases in UK jurisdiction.

English Contract Law

Contract law in the UK is an important area of legal study due to the influences of the British Empire. It is a common law subject and as such is governed by the principles of precedent through case law. Contract Law concerns the regulation of agreements, in particular for goods and services. Problems arise especially in relation to enforcement agreements. With the largest financial district in London, UK contract law is of global relevance for legal students in its relevance for mergers and acquisitions from the Anglo- American business world to business transactions in Hong Kong. This course will cover key aspects of: agreement, consideration, intention, mistake, misrepresentation and duress. These core aspects permeate throughout other legal subjects.

International Economics & Business

Monetary Policy and Central Banking

The course covers the literature on the transmission of central bank policies via the banking system and financial markets to the real economy featuring consumers and corporations. The coverage will include the analysis of both conventional monetary policy and unconventional measures such as quantitative easing and forward

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guidance over interest rates. After completing this course delegates will have a thorough understanding of the monetary policy transmission mechanism and policy challenges currently facing central banks around the world.

Entrepreneurship - Evaluation, Creation, and Funding of New Ventures

This course provides a comprehensive introduction to entrepreneurship and the realities of new venture creation. This is a growing and ever-changing field and this course will balance insights from famous cases and research into the field with the overall aim to provide a foundational knowledge on the practicalities of entrepreneurship. We look at both success and failure cases to understand which competencies, skills and tools are necessary to evaluate, create and guide your own business, or to support an employer in launching and growing an entrepreneurial venture. Subjects will include:

- Entrepreneurial Behavior
- The Cambridge Technology Cluster
- Entrepreneurship Theory
- Understanding Entrepreneurial Opportunities
- How to harness opportunities – including business models and entrepreneurial finance
- How to set up a venture

Philosophy, Politics and Economics (PPE) & International Relations

Contemporary PPE – Ethics & Logic

Since its beginnings in ancient Greece, the Western philosophical reflection how we should conduct our lives has been closely intertwined with the inquiry into *logos*, 'reason' or 'reason-ing', practical and theoretical, human or divine. While ethics and logic have developed in two distinct disciplines, different philosophical approaches to normative ethics and meta-ethics are often best understood as springing forth from different conceptions of the role that reason and argument (ought to) play in human morality, and from different assessments of the validity of certain key arguments (or alleged 'fallacies') in ethics, and of the force and implications of certain 'dilemmas' or 'paradoxes'. Competing ethical theories are typically in partnership with:



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construed dialectically: they argue for the deficiency of the rival theories, and defend themselves by denouncing the shortcomings in the logical of their attackers.

International Governance of the Future Managing Digitalization, Environmental Degradation and Depleting Resources

The main purpose of this course is to expose delegates to emerging topics in International Governance, topics that their generation will have to engage with and address effectively. As many of our students aim to become practitioners working in the field of International Affairs and Public Policy, this course is preparing them for their careers by exposing them to a wide range of emerging International Governance issues: the digitalisation of society and international affairs; the effects of artificial intelligence on the international job market and international migration; environmental degradation and effective management of depleting natural resources. These are issues that are not only considered by scholars and policy experts as due to grow in importance, but also issues that are of interest and currently cause concern to students and young people.

English Literature & History

An Actor's Approach to Shakespeare

This course of lectures will introduce students to a range of Shakespeare's plays and poems from the point of view of actors and directors approaching this material in preparation for performance. In this respect it will differ from more conventional academic and contextual approaches. The focus will range from production history (taking in the diaries, memoirs and accounts of notable performers during the last 400 years) to dramatic technique and dramaturgy. Delegates will learn about how styles of performance have changed – from the highly prescribed and mannered style of the early modern period to the more cinematic renderings of the modern day. They will also discover how the plays have been recontextualised in line with social and historical change – such as when Janet Suzman directed a colour-blind production of 'Othello' in South Africa at the height of Apartheid. They will develop a 'toolbox' of dramatic techniques which can be applied to the texts in order to draw

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out many of their more subtle nuances. Finally, they will consider the future for Shakespeare's plays and how modern styles, conventions and convictions continue to alter and affect the ways in which they are performed.

The British Industrial Revolution in Global Context

Following on from Economics I, this course will analyze the development of economics from Industrialisation until post World War II and the collapse of the Soviet Union. Delegates will look at the development of the modern economic system and how it has been adopted globally as well as identifying how historical events have impacted on economics.

STEM (Science, Technology, Engineering, Mathematics)

The Health of Nations: Current Challenge, Future Possibility

This course will provide an overview of the causes and the events of the recent 'global' financial crisis, as well as of the policy response by governments and central banks; explain the on-going problems in the Eurozone; explore potential risks of instability in China and apply the lessons of previous crashes to avoid instability.

Numerical Computing in C++

Quantum computing is a new model of computation based on quantum theory. A quantum computer could solve problems quicker than a classical. For example, a quantum computer could factorise quickly large numbers, which would make many current encryption systems unsafe. Large-scale quantum computers still do not exist but there is a lot of recent development in building small quantum computers that could do specific tasks such as factorising numbers.

This course will introduce the basic theory of quantum computation and will give examples of some quantum algorithms. We will start with discussing Hilbert spaces, which describe quantum systems. We will discuss superposition, entanglement and measurement of quantum states. We will then look at Boolean and quantum circuits as a model for classical and quantum computation. The course will end with the

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description of several quantum algorithms.

Quantum Computing

Quantum groups first appeared in the 1980s in the work of Drinfeld and Jimbo on universal R-matrices. These were related to exactly solvable systems in statistical mechanics. Quantum groups appear in many areas of mathematics and mathematical physics such as representation theory, non-commutative geometry, knot invariants, conformal field theory and topological quantum field theory.

Materials Engineering: Dynamic Behaviour of Materials

This course will introduce students to the effect of rapidly applied loads to different categories of solid materials. It will focus on direct industrial applications, providing the required tools to fully understand the dynamic behaviour of materials, and how it can be used within the design process of real-life components.

The first part of the course will introduce the concept of dynamic behaviour and wave propagation within solid materials. The different types of elastic waves will be defined, and the analytical representations of the single waves and their interaction with the domain boundaries will be derived.

The second part of the course will expand the range of deformation mechanisms by including plastic and shock waves. The different characteristics of elastic and plastic waves, and the effect of permanent deformation of the material will be analysed.

The third and final part of the course will focus on the techniques used to characterise solid materials at different loading rates. Examples of testing techniques using different methods to deliver the load, from gravity (i.e. drop tower) to explosives (e.g. ring expansion tests), will be described to cover an extremely wide range of strain-rates.

Cryogenic Engineering: Cryocoolers for Space

Cryocoolers are low temperature (below 120 K) refrigerators that provide cooling for electronic devices such as infra-red detectors and superconducting devices. The operation of cryocoolers involve complex thermodynamics which are not always intuitively understood. In this course we will start by going over the first and second laws of thermodynamics and then explore a number of relevant thermodynamic cycles

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in detail. We will cover the basic principles behind the Stirling, Pulse Tube, Gifford-McMahon and Joule-Thomson cryocoolers with a focus on space applications. The performance and the advantages and disadvantages of the cryocoolers will be discussed and current research areas will be presented.

Microelectronics Circuits and Analogue Devices

This course provides a brief yet comprehensive description of standard electronic devices and circuits. It starts with a look at the electrical properties of semi-conductors, highlighting the difference with insulator and metals and how these properties can be exploited to create active devices.

The focus will then shift to the most common device used for consumable electronics: the MOSFET, looking at its transfer characteristic and its properties as a controllable switch as well as the problems induced by the size reduction achieved throughout the years.

The second half of the course will then look at how the MOSFET can be used to create the building blocks of a combinatorial circuit able to perform logic and binary operations. Starting from the simplest logic circuit – an inverter – more articulated configurations will be analysed throughout the lessons reaching a full adder to perform binary summation on an arbitrary number of bits. Finally, the course will also briefly discuss the memory elements required to achieve a sequential circuit with memory of its previous state.

Introduction to Nanomaterial

The course provides essential knowledge on the fundamentals of nanomaterials and their applications in making today's and future devices. The course will define what low-dimensionality is and how the nanomaterials can take various forms. The students will also be able to develop knowledge on the changes in the physical and chemical properties of materials as they go to the nanoscale. The students will explore some examples of nanomaterials such as carbon nanotubes and graphene.

The course also provides knowledge on the nanomaterials fabrications and assembly in 3D to produce novel structures that can be used to change the world. The students

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will also learn about some real-life applications of nanomaterials and the basic science behind them.

Stem Cell Biology

The course will be focused on stem cell biology and in particular on embryonic stem cells, the stem cells that have the potential to create all the cell types of the adult body.

The first course will go over aspects of early embryonic development to explain the origin of the in vivo equivalent of embryonic stem cells. These arise early on during embryo development and can be isolated in the petri dish as embryonic stem cells. The first course will also cover aspects of adult stem cells where it will be explained that despite these cells exhibiting some developmental potential this is restricted compared to that of embryonic stem cells.

III. Faculty

Summer Institute here at Oriel College Oxford (Online Programme) consists of a strong team of faculty members including university lecturers, researchers, college tutors, and DPhil candidates from the University of Oxford (UK) and the University of Cambridge (UK).

In previous years the following faculty members have taught the courses at the *Summer Institute here at Oriel College*:

Dr Mohammad Amin Abolghasemi, Oriel College, University of Oxford (UK)

Dr Alexandra Bocse, Trinity College, University of Cambridge (UK)

Dr Monique Boddington, Judge Business School, University of Cambridge (UK)

Associate Prof. Christopher Bowdler, Oriel College, University of Oxford (UK)

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Associate Prof. Luca Castagnoli Oriel College, University of Oxford (UK)

Prof. Stefan Enchelmaier, Lincoln College, University of Oxford (UK)

Dr Claudio Falco, Department of Engineering, University of Cambridge (UK)

Dr Simone Falco, Oriel College, University of Oxford (UK)

Prof. Keith Hawkins, Oriel College, University of Oxford (UK)

Prof. Yakov Kremnitzer, Mathematical Institute, University of Oxford (UK)

Dr Alexis Litvine, Trinity College, University of Cambridge (UK)

Dr Brian McMahon, Sommerville College, University of Oxford (UK)

Dr Robert Pikethly, St Peter's College, University of Oxford (UK)

Dr Jose Silva, MRC Cambridge Stem Cell Institute, University of Cambridge (UK)

IV. Additional Course Features

Cultural Activities in Oxford: Throughout the programme, delegates will have a unique opportunity to get to know the city of Oxford through a variety of live virtual activities such as:

- Oxford City Walking Tour
- Oriel College Tour
- The Ashmolean Museum tour
- Oxford University Botanic Garden
- Oxford Pub Tour
- Evening talk

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V. Certificate, Academic Transcript, and Accreditation

The online programme comprises one course per week. Each week's workload, including the lectures, group discussion, study time and assessment, is designed to be equivalent to 2 - 3 ECTS credits or 1 - 1.5 US credits. Delegates are invited to participate in one examination at the end of each course.

Upon a successful completion of the course, delegates will receive a Certificate of Attendance and an Academic Transcript issued by Oriel College, Oxford UK.

Summer Institute here at Oriel College (Online Programme) is a certified programme that may account for optional credits depending on the requirements of the home institution/school/university.

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Educational Travel & Experiences