



Oxford Study Abroad Programme

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Oxford Study Abroad Programme runs residential courses at St Antony's College, University of Oxford. Our online courses have been organised in response to the COVID-19 pandemic.

**Oxford Study Abroad Programme
Online Courses Winter 2022
17th-29th January 2022
Course 1 Artificial Intelligence and Machine Learning
Course 2 Business and Management - Entrepreneurship and Leadership**



01 | Oxford Study Abroad Programme

Oxford Study Abroad Programmes are held at Oxford all year round. These academic programmes are organised for students from universities all over the world. Our programmes allow students to gain knowledge from Oxford University and other world-famous institutions in the UK while experiencing Oxford city and student life during your stay.

OSAP online courses have been organised in response to the COVID-19 pandemic. The goal of these online courses is to minimise the need to gather in large groups and spend prolonged time in close proximity with each other in spaces such as classrooms, dining halls, and residential buildings. This is consistent with the recommendations made by leading health officials on how to limit the spread of COVID-19 and is consistent with similar decisions made by a number of our peer institutions.

These academic online courses are designed to provide talented and aspiring university students and professionals wanting to pursue high-level research or management careers with exposure to current global trends. These key areas include governance and policy; design and planning; technology and innovation; economics, finance and commerce; and socio and cultural development. These courses aim to connect top research and best practice by engaging participants in interactive and participatory lectures and seminars taught by leading experts at the University of Oxford as well as in business and industry sectors. It provides a global and comparative perspective on major aspects of contemporary and near future world development with case studies from around the world, in order to explore innovative and sustainable practices that balance economic, environmental and social aspects of world development.

02 | Online Courses

Online courses are similar to classroom courses, except that the delivery of learning (lectures, homework, quizzes, readings) and interaction with students and instructors is all online. The 2-week programme of modules includes intensive online lectures and tutorials, followed by a period for assignment work. Attendance on the modules is required in order to complete the course.

Most days start with a lecture delivered by the instructor, which is complemented with a seminar for Q&A, discussions, and feedback. Workshops, tutorials, and group work are followed to consolidate the students' learning on the course. Case studies are used to illustrate real-world examples and develop the students' knowledge and understanding of the subject.

A certificate of participation and grade (letter) will be awarded to each participant for their constructive contributions in lectures, seminars, discussions, exercises and assignments for the duration of the course.



03 | Online Courses Winter 2022

Course 1: Artificial Intelligence and Machine Learning (40 contact hours in total)

Course Plan

- All sessions start with a look at the wider implications of artificial intelligence on society, the economy and the world, and follow with the technical sessions.

Pre-requisites:

1) Mathematics

Students should develop some skill and familiarity with the mathematical topics below. Knowledge of these topics may be acquired by the students before the course starts.

Mathematical Topics

Matrices

- What a matrix is: Matrix representation of data-sets
- Matrix operations: Addition (+), Subtraction (-), Multiplication (.), Transpose (T)
- The link between algebra and matrices: Expressing systems of algebraic equations in matrix form

2) The course programming language is Python

Python Programming Language

- You do not need to be highly skilled at Python before starting the course
- The majority of activities will require you to read and replicate existing code, but not to write new programmes

Course Outline (40 contact hours in total)

<p>Part 1: Artificial intelligence on society, the economy and the world (10 contact hours)</p>	<ul style="list-style-type: none"> Model Fitting Beyond linear models: Polynomial and logit fits Classic ML Algorithms Gaussian Mixture Models Natural Language Processing Deep Learning Reinforcement Learning
<p>Part 2: Technical Sessions (20 contact hours)</p> <ul style="list-style-type: none"> Model Building Unsupervised learning 	<ul style="list-style-type: none"> Probability What is a 'probability'? Different views of what a probability represents: Bayesian Vs. Frequentist view Operations on probabilities: 'AND' and 'OR' Definitions: 'Statistical distribution', 'Sample Space', 'Random Variable' Discreet Vs. Continuous Random Variables and the relationship between them Expectation: Definition and use in valuing options

Part 3: Public Lectures (8 contact hours)

- The Future of Work
- AI and Big Data
- The Application of AI
- The Secrets of Creativity from Big Data

Part 4: Sharing Sessions (2 contact hours)

- What is My Life Like in Oxford by Two PhD students of Oxford University?

Final Assessment:

An individual project is required by the instructor for the final assessment.

Course 2: Business and Management-Entrepreneurship and Leadership (40 contact hours in total)

Course Outline (40 contact hours in total)

Part 1: Entrepreneurship (18 contact hours)

- The Entrepreneurial Process
- Corporate Entrepreneurship
- Forms of Finance & The Financial Model
- Intellectual Property
- Business Models

Part 2: Leadership Module (12 contact hours)

- From 'start-up' to 'grown-up': Scaling organisations through design (Google/Alphabet case study)
- Power and Influence: Leading with and without Authority

- Organisational culture and inclusion in the technology industry (#MeToo: Susan Fowler's very strange year at Uber)
- Self-organising through technology (Zappos Case Study)

Part 3: Public Lectures (8 contact hours)

- The Future of Work
- AI and Big Data
- The Application of AI
- The Secrets of Creativity from Big Data

Part 4: Sharing Sessions (2 contact hours)

- What is My Life Like in Oxford by Two PhD students of Oxford University?

Final Assessment:

A business plan is required to be presented in small groups on the last day of the course.

04 | Sample Timetables

Timetable for Course - Artificial Intelligence and Machine Learning

WEEK ONE	Day 1 17/01	Day 2 18/01	Day 3 19/01	Day 4 20/01	Day 5 21/01	Day 6 22/01	Day 7 23/01
UK Time 5:00-7:00 China Time 13:00-15:00	Lecture	Lecture	Lecture	Lecture	Lecture	Public Lecture 1	Rest
Break	Break	Break	Break	Break	Break	Break	
UK Time 7:30-8:30 China Time 15:30-16:30	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Public Lecture 2	

WEEK TWO	Day 8 24/01	Day 9 25/01	Day 10 26/01	Day 11 27/01	Day 12 28/01	Day 13 29/01	Day 14 30/01
UK Time 5:00-7:00 China Time 13:00-15:00	Lecture	Lecture	Lecture	Lecture	Lecture	Public Lecture 3	Rest
Break	Break	Break	Break	Break	Break	Break	
UK Time 7:30-8:30 China Time 15:30-16:30	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Public Lecture 4	

Timetable for Course - Business and Management-Entrepreneurship and Leadership

WEEK ONE	Day 1 17/01	Day 2 18/01	Day 3 19/01	Day 4 20/01	Day 5 21/01	Day 6 22/01	Day 7 23/01
UK Time 9:00-11:00 China Time 17:00-19:00	Lecture	Lecture	Lecture	Lecture	Lecture	Public Lecture 1	Rest
Break	Break	Break	Break	Break	Break	Break	
UK Time 13:00-14:00 China Time 21: 00-22:00	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Public Lecture 2	

WEEK TWO	Day 8 24/01	Day 9 25/01	Day 10 26/01	Day 11 27/01	Day 12 28/01	Day 13 29/01	Day 14 30/01
UK Time 9:00-11:00 China Time 17:00-19:00	Lecture	Lecture	Lecture	Lecture	Lecture	Public Lecture 3	Rest
Break	Break	Break	Break	Break	Break	Break	
UK Time 13:00-14:00 China Time 21: 00-22:00	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Workshop and Tutorial	Public Lecture 4	

* Note: The schedules are subject to change as a result of new information, changes in process requirements and the availability of resources.

05 | Main Instructors and Guest Lecturers



Dr Nigel Mehdi

Senior Associate Tutor in Sustainable Urban Development, Department for Continuing Education, University of Oxford
Visiting Lecturer, Software Engineering Programme, Department of Computer Science, University of Oxford

Dr Mehdi works at the intersection of information technology, the built environment and urban sustainability. He teaches at Oxford on the Sustainable Urban Development programme and on the Software Engineering Programme. He is a consultant in private practice where he specialises in IT, software development, risk and process management. His current professional interests are focused on the management of big data and the measurement and computer modelling of sustainability metrics for the built environment.



Dr Rob Collins

Dean of Degrees, Fellow, Department of Computer Science, University of Oxford

Dr Rob Collins has been teaching on the MSc in Software Engineering at the University of Oxford for the last 10 years. Currently he teaches two courses: Safety Critical Systems and Software Testing. He also teaches the Systems Engineering Fast-Track course through the Department for Continuing Education.



Dr Chris Moos

Lecturer in Organization Studies, Saïd Business School, University of Oxford

Dr Moo's researches how leaders and organisations deal with the complex demands of diverse and pluralistic environments. His research focuses on leadership, institutional complexity, pluralism, paradox, and social evaluations. In particular, he is interested in how leaders create complementarities between the competing expectations they are exposed to. His teaching topics including leadership, teamwork, organisation design, and organisational culture to MBAs, Diploma students, EMBA's, and Executives, drawing on his own research, as well as insights from technology firms like Facebook, Google, Uber, Zappos and Tesla.



Dr Arhat Virdi

Fellow in Finance and Economics, Saïd Business School, University of Oxford

Dr Virdi is concerned with applying the kind of analytical rigour found in philosophical analysis to social scientific research generally. His current interests are focused on methodological issues within Economics, the possibility of objectivity in Financial Reporting, and the soundness or otherwise in thinking that Game Theory has real-world applications. He teaches (and has extensive teaching experience in) a variety of undergraduate and postgraduate courses across all Finance, Accounting, Management and Economics disciplines.



Professor Nick Hawes

Associate Professor in Engineering Science (Robotics), Tutorial Fellow in Engineering Science, Pembroke College, University of Oxford

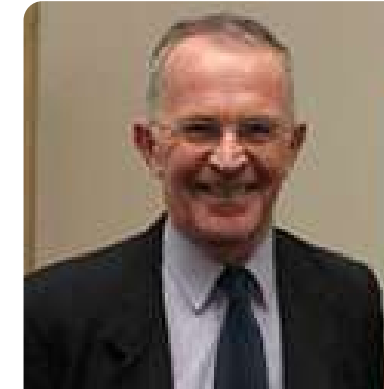
Professor Nick's research interests lie in the application of Artificial Intelligence (AI) techniques to create intelligent, autonomous robots that can work with or for humans. He has worked on long-term autonomy for mobile robots; mixed initiative or shared autonomy between humans and robots; information-processing architectures for intelligent systems; the integration of AI planning techniques into a variety of robot systems; and the use of qualitative semantic and spatial representations to enable robots to reason about the possibilities for action in their worlds.



Dr Bruno Lacerda

Senior Researcher in Robotics, Oxford Robotics Institute, University of Oxford

Dr Lacerda's research focuses on the intersection of decision making under uncertainty, formal methods and mobile robotics. In particular, he is interested on the use of a combination of techniques from learning, planning and model checking to synthesise intelligent, robust and verifiable behaviour, both for single and for multi-robot systems.



Professor Andrew Goudie

Emeritus Professor in Geography, University of Oxford
Member of the Landscape Dynamics research cluster

Professor Andrew Goudie was Professor of Geography and a Fellow of Hertford College from 1984 to 2003. A distinguished physical geographer, he was awarded the DSc by the University in 2002, a Royal Medal from the Royal Geographical Society in 1991, the Prize of the Royal Belgian Academy for 2002. He was President of the British Institute in Eastern Africa, 2011-2016, and from September 2005-2009 he was President of the International Association of Geomorphologists. He has recently been Director of the China Centre, Oxford (2011-2013), President of the Geographical Association, President of Section E of the British Association, and Chairman of the British Geomorphological Research Group.



Dr Paul Duckworth

Oxford Robotics Institute, Department of Engineering Science, University of Oxford

Dr Duckworth is a postdoctoral research assistant at the Oxford Robotics Institute, and a Lecturer at Brasenose College. He is working in the GOALS research group combining probabilistic machine learning with goal-oriented planning under uncertainty for improved autonomous mobile robot behaviour.

He is also currently working on machine learning for healthcare applications in the following areas:

- i) investigating AI radiotherapy planning as part of Cancer Research UK RadNet project;
- ii) part of the Astronaut Health Team looking at causality and out-of-distribution generalisation at The Frontier Development Lab (FDL 2021) with NASA & SETI Institute;
- iii) exploring AI supported decision-making and explainable AI for early stage diagnosis of colorectal cancer, as part of a Data Study Group with the Alan Turing Institute, UK and Odin-Vision.

06 | Entry Requirements

Eligibility

1 year of undergraduate study and aged 18 or above, i.e., undergraduate and postgraduate (including MSc students and PhD students)

GPA requirement

At the time of joining the OSAP programme you will normally be able to demonstrate an average grade, or equivalent academic experience, of:

- 2.8/4.0 GPA (US scale) or 70/100 Percentage Grade Level or 2:2 (UK scale)

Notes:

- * 1st-year undergraduates from some partner universities do not need to submit academic results. For more details, please contact your home institution.
- * Please note that for some of the courses, there are additional pre-requisites. Please see individual course pages for details or contact us at apply@oxfordstudyabroad.org.uk.

English language requirement

Proof of English proficiency is not required for applicants whose first language is English, those whose first language is not English but have been involved in a full-time degree-level academic programme at a university where English is the language of instruction, or those who have extensive experience working in a professional English-speaking environment. Otherwise, you will need to demonstrate proficiency by providing us with a recognised qualification.

The majority of modules normally require a level of minimum IELTS 5.5 or equivalent. Please find more details below:

English proficiency

- 1) IELTS: minimum 5.5 for overall average
- 2) TOEFL: minimum 85 for the overall score
- 3) College English Test (CET)-4: minimum 425 (applicable to Chinese university applicants only)
- 4) College English Test (CET)-6: minimum 500 (applicable to Chinese university applicants only)

- * For applicants who have not taken the above tests by the time of application or have not been in a professional English-speaking environment for years, their English proficiency will be assessed through a virtual-interview by the programme officer.
- * The selection panel of the programme will consider the overall qualifications of each applicant.

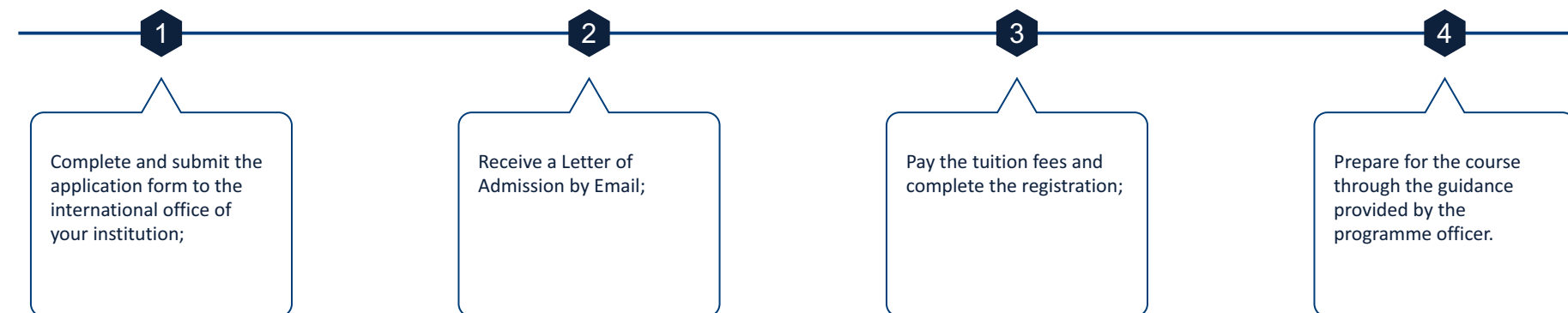
07 | Scholarships

A limited number of scholarships (normally for university students) are available for those participants who demonstrate a competitive performance during the programme and in the home institution.

For more information, please read the Q&A for your reference, or email to apply@oxfordstudyabroad.org.uk



08 | Application Procedures:



For more information on the programmes, please contact the international office of your home institution, or email to apply@oxfordstudyabroad.org.uk.