Regent's Park College OXFORD

Oxford Prospects and Global Development Institute

Oxford Prospects Programmes

Oxford Prospects Programmes

Navigating Interdisciplinary Frontiers in the Age of AI

Programme Introduction

The University of Oxford, a globally renowned institution, boasts a rich history dating back to the late 11th century. Notably, it was ranked as the world's top university for nine consecutive years, from 2016 to 2025. Oxford is home to a highly distinguished faculty, including 83 Fellows of the Royal Society and 125 Fellows of the British Academy. Over the past nine centuries, the university has nurtured many notable figures, including 6 Kings of England, 31 British Prime Ministers, numerous heads of government from around the world, more than 70 Nobel Laureates, and a wealth of esteemed writers and scholars who have pioneered research across various academic fields.

The Oxford Prospects Programme, organised by the Oxford Prospects and Global Development Institute (OPGDI), is committed to promoting international academic exchange, particularly between higher education institutions in China and the UK. The programme offers on-site interdisciplinary courses to students selected from top Chinese universities. Over the course of two weeks, participants will immerse themselves in Oxford’s unique academic and cultural environment. This invaluable experience gives students the opportunity to study at a world-class university and may inspire further academic pursuits, such as the Visiting Student Programme (VSP), or Master's and PhD degrees at Oxford or other leading universities.

Basic Information

Entry requirements:
The programme is open exclusively to undergraduate and Master's students aged 18 to 25 from partner universities. An English proficiency assessment is a requisite for all applicants; however, this requirement is waived for those who can provide evidence of having attained a minimum IELTS score of 6.5 or a TOEFL score of 90.

Assessment:
The course assessment comprises: **a)** Academic tests; **b)** Academic presentations; **c)** Attendance and participation

Application Enquiry:
For enquiries regarding the syllabus, fees, and other related matters, please contact us at:
Wechat: oppadmin
Email: admin@oxford-prospects.com

Programme Achievements:
Participants will receive a Programme Certificate and an Academic Transcript.

Programme Structure

1 Interdisciplinary Academic Lectures

2 Academic Workshops

3 Supervision Sessions

4 Guest Lecture

5 Enterprise /Lab Visits

6 Capstone Project

01 | Interdisciplinary Academic Lectures

Rooted in Oxford's prestigious interdisciplinary tradition, this programme is designed to develop the skills required for success in both your academic life and your career beyond university. Through 5 core modules spanning 20 disciplines and 90+ topics, the programme focuses upon the two most pressing topics of our time – the impact of AI and the drive for sustainability. Led by some of Oxford's most senior faculty scholars presenting their groundbreaking research, it provides direct engagement with Fellows of the Royal Society, Professors and Senior Researchers at the University of Oxford and innovative entrepreneurial start-ups linked to the university and its enterprise hubs.

The British Academy

Royal Academy of Engineering

THE ROYAL SOCIETY

The Academy of Medical Sciences

BFM MODULE

Business – Finance Management

This module explores how globalisation impacts business management and the type of leadership and entrepreneurship needed for the future. Topics such as sustainability, digital transformation, quantitative economics, game theory, cryptocurrency, innovation, and the political economy of international business will encourage students to critically assess market mechanisms and policy decisions.

See Page 14 - 15 for the detailed syllabus.

PPEL MODULE

Politics - Philosophy Economics - Law

This course, originally pioneered at Oxford, remains a top discipline in the humanities and social sciences. It fosters an understanding of society through the complementary lenses of politics, philosophy, economics, and law, exploring themes like decision-making, market economies, and societal transformation.

See Page 10 - 11 for the detailed syllabus.

STEM MODULE

New Frontiers of Science: Math, Physics, Computer Science and Engineering

Students will delve into cutting-edge topics like big data, smart cities, low-carbon energy, AI-driven manufacturing, and quantum computing. The module emphasises the integration of multiple disciplines to solve real-world problems, focusing on the practical application of scientific and technological advancements.

See Page 16 - 17 for the detailed syllabus.

LLD MODULE

Literature - Language Digital Culture and Communication Studies

This forward-thinking module examines how media and digital culture shape perspectives and influence cross-cultural communication. Students will also explore literature's role in understanding the self and the broader cultural context.

See Page 12 - 13 for the detailed syllabus.

MS MODULE

Medical Science

Covering a wide range of medical topics such as cancer research, brain aging, stem cell therapies, and gene editing, this module offers a deep dive into medical and clinical research. It examines the latest technologies in tumour imaging and neurodegenerative diseases while also exploring the processes involved in clinical trials and drug development.

See Page 18 - 19 for the detailed syllabus.

02 | Academic Workshops

These workshops are designed to equip students with essential academic and professional skills. They cover scientific research methods, academic writing, and presentation design, including a dynamic visual media workshop and public speaking sessions to hone communication skills. Additional sessions will demonstrate the latest research methods, such as the ethical use of AI, online research, and digital databases. A key highlight is a roundtable discussion with current Oxford students, offering direct insight into life at one of the world's top universities.

- **Research Methods**
- **Academic Presentation**
- **Critical Reading and Thinking**
- **Public Speaking**
- **Visual and Digital Communication**
- **Guidance on University Application**
- **Oxford Student Roundtable**

03 | Supervision Sessions

Intensive small-group mentoring sessions are modeled on Oxford's centuries-old tutorial system, with the addition of 21st-century skills development. The sessions are facilitated by dedicated academic mentors who support students as they work in groups of approximately 4-5 on the Capstone Project. Through supportive supervisor and peer-to-peer feedback, the sessions focus on cultivating critical analysis and innovative solutions to a set problem. The group dynamics also help develop teamwork and time management skills.

04 | Guest Lecture

The programme features a distinguished guest speaker providing unique, sector-specific insights. Past luminaries have included: the Executive Producer of Downton Abbey, the Bank of England's Chief Data Officer, a BBC Director, a renowned British photographer, a World Bank Vice President, and a UN Commissioner. This exclusive opportunity allows students to connect with world-class leaders and gain an unparalleled understanding of various industries.

05 | Enterprise /Lab Visits

Visits to local enterprises and research facilities bridge the gap between the classroom and the workplace. Students will gain exposure to innovative research and emerging fields in areas such as biotechnology and materials science. Visits to globally recognised enterprises allow students to learn more about international standards, regulations, and business strategies. Past engagements include: Silverstone, Jaguar Land Rover, Mini Plant Oxford, the Bank of England, London Stock Exchange, and ACCA headquarters.

06 | Capstone Project

This capstone project is an integral component of the programme, designed to culminate a student's academic experience by applying theoretical knowledge to a substantive, real-world challenge. The projects are grounded in a forward-looking perspective, addressing critical contemporary issues and equipping students with the mindset and capabilities of future leaders and innovators.

Key Project Components:

- Contemporary Issues: Projects address pressing challenges such as the ethical dimensions of innovative medical advancements, the geopolitical ramifications of social media, and the evolving implications of artificial intelligence on personal identity.
- Interdisciplinary Collaboration: Students work in diverse groups, synthesising knowledge from various disciplines to develop innovative solutions. This process cultivates a capacity for effective collaboration among peers from different academic backgrounds.
- Practical Application: Students must critically consider real-world constraints, including feasibility, sustainability, and ethical implications, bridging scholarly inquiry with practical application.
- Skill Development: The project promotes the development of key competencies in collaboration, communication, and complex problem-solving.
- Formal Presentation: The final solution is presented to a panel of academics, demonstrating a mastery of the skills cultivated throughout the programme.

"The capstone project isn't just a classroom exercise; it's the heart of our curriculum. It's not just about remembering what you've learned and then passing a test. It's about using that knowledge to solve real – world problems.

Working as part of a team, you'll come up with innovative solutions to the most pressing issues of our time - from global sustainability to the ethical use of AI."

-- Dr Gayle Lonergan, Academic Lead

Global Competence and Intercultural Activities

Gala Ball

Imagine a magical evening under the stars at an Oxford Ball, where tradition meets youthful exuberance. This highly anticipated event immerses students in the elegance and charm of a quintessential British social gathering.

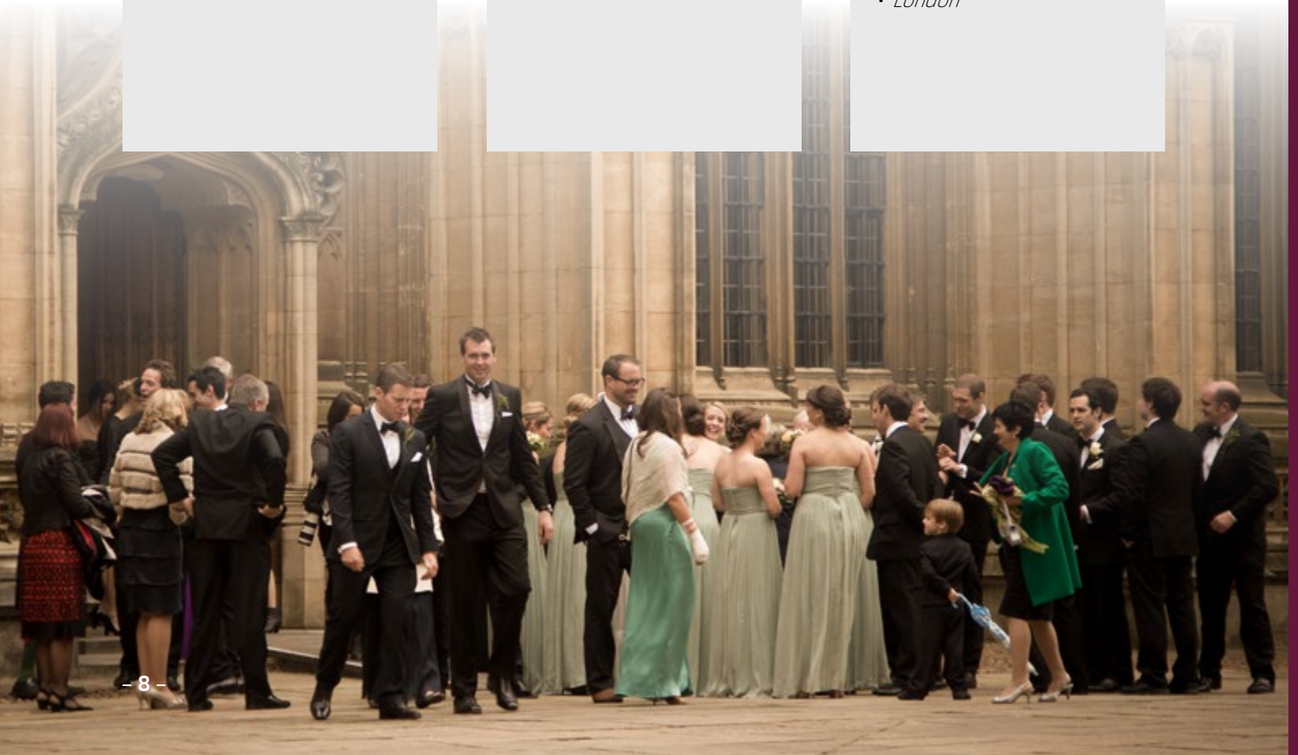
Formal Dinner

Savour the Oxford tradition of a Formal Hall: a scholarly finale dinner celebrating academic achievements and in the company of Fellows of the constituent colleges of the University of Oxford.

Cultural Excursions & Enrichment

Beyond the classroom, there will be a series of cultural excursions including:

- *Traditional Afternoon Tea*
- *Windsor Castle*
- *Stratford-upon-Avon* *(Shakespeare's Birthplace)*
- *London*



Student Testimonials

I realise for the first time that doing academic work is something so pure and truly enjoyable.

In my impression, those giants of academia always seemed out of reach. However, during this program, I was incredibly fortunate to engage in face-to-face discussions with professors from Oxford University, and I even met Fellows of the Royal Academy of Engineering! The humility and objectivity that the professors displayed in their lectures,along with their friendliness and patience in answering our questions, made me realise for the first time that doing academic work is something so pure and truly enjoyable.

-- Mr Huang, Beijing Normal University

The concept of interdisciplinary integration emphasized in the course brought me great inspiration.

From Christ Church to Blackwell, from the British Museum to the Ashmolean Museum, we gained a lot from our packed daily courses and activities. We experienced different cultural traditions, teaching methods, and attitudes toward life. The concept of interdisciplinary integration emphasised in the course brought me great inspiration. Politics, economics, law... they are all fascinating and always intertwine with philosophy itself, giving me a deeper understanding of the richness and depth of various disciplines.

-- Mr Liao, Tsinghua University

The magical chemistry resulting from the clash between classical and modern British culture, it left a lasting impression on me.

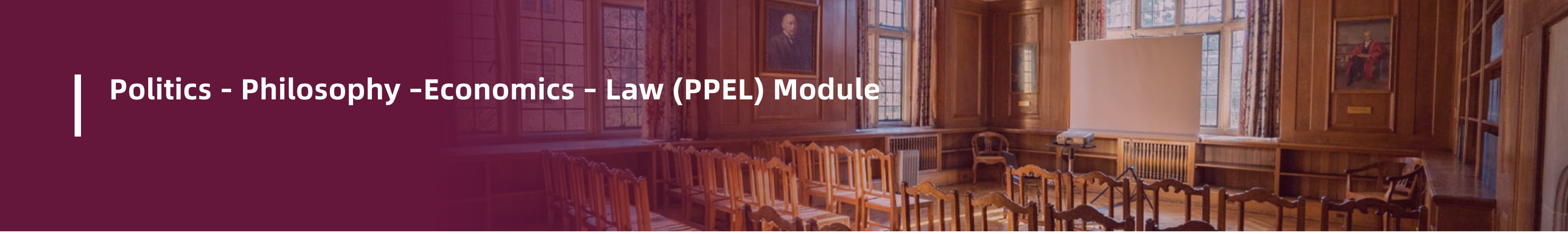
This is the most fulfilling programme l have ever participated in. Whether it was the enlightenment from the academic courses, the awe of the ancient campuses, or the magical chemistry resulting from the clash between classical and modern British culture, it all left a lasting impression on me. On the final day, I reluctantly said goodbye to the teachers and fellow participants from all corners of the world. I'm deeply grateful for the thoughtful and enriching
arrangements made by the staff of this programme. I wish all my fellow participants the best of luck, and with the long future ahead, I look forward to meeting again.

-- Ms Zhang, Fudan University

Those quintessentially British experiences, which I had only seen on screen, were now a reality for me.

From balls, traditional British etiquette, to High Table dinners—these quintessentially British experiences,which I had only seen on screen, were now a reality for me. During the two weeks of studying and living at the college, I also visited the Jaguar Land Rover factory. The packed schedule taught me the Oxford spirit of ' Work Hard, Play Harder ' . It felt less like I was participating in a short-term programme and more like I had begun my study abroad life ahead of time.

-- Ms Lin, Xiamen University



Politics - Philosophy -Economics - Law (PPEL) Module

01 | MODULE DESCRIPTION

How can we ethically regulate AI? What power does a nation hold in shaping global norms? How can societies manage the spread of misinformation? What characteristics should a leader have in times of crisis?

"We hope that your time here will be both stimulating and engaging, as you examine the intersections of politics, philosophy, economics, and law, and immerse yourself in the rich intellectual and historic environment of this remarkable city."

Welcome Notes

This interdisciplinary module introduces students to key global challenges through the combined lenses of politics, economics, philosophy and law. Students will explore international relations, geopolitical shifts, and the impact of digital diplomacy, with case studies such as Sino-UK relations. The module examines how economic theory informs sustainability, focusing on waste management, the circular economy, and the changing nature of work. Ethical and philosophical perspectives are integrated to address issues like belief systems, happiness, and practical decision-making. Students will also gain insight into modern British governance and the influence of liberal and neo-liberal ideologies on policy and society. Learning from and engaging with leading Oxford academics, this course will equip students with theoretical and methodological tools and expertise to engage systematically with political and economic questions in a broader international context.

The course is for students of:

Social Sciences and, in particular, fields related to: Politics and Administration, International Relations, Philosophy, Sociology, Economics and Trade, Law, Journalism, etc.

Module Lead: Professor Michael Freeden

Prof Freeden is Emeritus Professor of Politics, University of Oxford. He is a Fellow of the Academy of Social Sciences and has been awarded the Sir Isaiah Berlin Prize for Lifetime Contribution by the UK Political Studies Association.

02 | LEARNING OUTCOMES

Upon completing this module, students will understand the complex interplay of global politics, international economics, and philosophical theories on international relations and social development. They will also gain insight into the influence of international organisations and legal systems, as well as the link between social science theory and practice.

03 | MODULE OVERVIEW

Unit 1: International Relations and Geopolitics

- Foundational International Relations
- Sino-UK Relations Analysis
- Climate Change & News Media
- Russian Foreign Policy Evolution

Unit 2: Economics and Social Impact

- Foundational Concepts of Economics
- The British Economy: Past, Present, Future
- Hidden Human Labor Powering AI
- The Changing Nature of Work
- Social Media: Identity and Identification

Unit 3: Advanced Studies in Philosophy, Ethics, and Cognitive Theory

- Practical Ethics: Ethics in the Real World
- Happiness First: Normative Dimensions
- Artificial Intelligence: Ethics and the Future
- The Philosophy and Cognitive Science of Delusional Thinking
- Modern Feminist Theory

Unit 4: Political Science and Law

- Modern British Government
- Government Capacity to Regulate AI
- Foundational Political Philosophy
- Liberalism and Neo-Liberalism

(This syllabus is a proposed framework. The curriculum is subject to annual review and will be updated to incorporate frontier academic topics and emerging advancements in the field.)

Proposed Reading List

- Wolff, J. (2006). An Introduction to Political Philosophy. Oxford University Press.
- Acemoglu, D. and Robinson, J.A. (2012). Why Nations Fail: the Origins of Power, Prosperity and Poverty. New York: Crown Publishers.
- Waltz, K. (1979). Theory of International Politics. Boston: Addison-Wesley Publishing Company.
- Norris, P. and Inglehart, R.F. (2019). Cultural Backlash: Trump, Brexit, and Authoritarian Populism. Cambridge University Press.
- Allen, R.C. (2011). Global Economic History: A Very Short Introduction. Oxford University Press.

More readings and resources will be given prior to the start of the programme.

Literature - Language- Digital Culture and Communication Studies (LLD) Module

01 | MODULE DESCRIPTION

How has the rise of digital media transformed journalism? Can we truly deconstruct a text when its words were generated by an AI without consciousness or intent? Ever wondered what happens behind the scenes of the most successful British show worldwide of all time - Downton Abbey?

"*This is a place where questions are welcomed, discoveries are made, and ideas take flight. Though Oxford may appear steeped in formality, it remains open to all who seek to learn, offering both challenge and inspiration.You, too, are now part of this tradition - you belong here.*"

Welcome Notes

When we read, we are making sense not just of the words on the page, but of the ideas being communicated to us. In this forward-thinking course, students will have the opportunity to consider the underlying messaging of written medias – from classical literature to online journalism – across cultures. Students will consider representations of different groups of people in classical literature such as Shakespeare and Austen, developing their critical thinking and analysis skills. Students will explore the modern age of digital communications, such as journalism and film, and its implications on society. Throughout this unit, students will engage with the latest research in literature, language and intercultural communication.

The course is for students of:

English Language and Literature, Foreign Languages, Linguistics, Journalism, Translation, Chinese Language and Literature, Sociology, Anthropology, History, Drama, Film and Television, Media Studies, Arts, Cross-cultural Communication, Library Studies, Humanities and Education, etc.

Module Lead: Professor Diane Purkiss

Professor Diane Purkiss is Fellow and Tutor of English at Keble College, University of Oxford. She specialises in Renaissance and women's literature, witchcraft and the English Civil War. Purkiss was born in Sydney, Australia, and gained her D.Phil. from Merton College, University of Oxford.

02 | LEARNING OUTCOMES

Upon completion of this module, students will be able to analyse Western literature and visual arts using various theoretical approaches. They will gain insight into cultural representations and intercultural communication by exploring classic and modern texts. Additionally, the module will familiarise students with major trends in digital cultures and their impact on society.

03 | MODULE OVERVIEW

Unit 1: Advanced Literary Theory and Cultural Texts

- Deconstruction of Language in the age of AI
- Gothic Literature: Evolution and Influence
- Femininity in Victorian Literature
- Cultural Diplomacy in Shakespeare and China

Unit 2: Ecocritical Perspectives and Environmental Narratives in Literature

- Theoretical Frameworks and Literary Analysis
- Environmental Justice in Contemporary Literature
- Case studies: Ecocritical Approaches to Latin Literature
- The Ecology of Writing: Interconnected Systems
- Environmental Philosophy and Literature

Unit 3: Global Linguistic Transformations and AI Communication

- Intercultural Communication: Theory, Practice and AI Translation
- Globalisation on Language: Progression and AI Impact
- Endangered Languages: Documentation and Preservation
- Language and Cultural Identity: Behind Communication

Unit 4: Digital Culture, Media Dynamics and Critical Analysis

- Digital Media Ecologies: Interactions and Influences
- The Future of News: Audience inside the Story
- Critical Theories of Digital Media and Communication
- Digital Storytelling and Content Creation

(This syllabus is a proposed framework. The curriculum is subject to annual review and will be updated to incorporate frontier academic topics and emerging advancements in the field.)

Proposed Reading List

- Pinker, S. (1994). The Language Instinct: The New Science of Language and Mind. London: Penguin Books.
- Zimmermann, T. and Sternefeld, W. (2013). Introduction to Semantics: An Essential Guide to the Composition of Meaning. De Gruyter.
- Stark, W. (2023). Introduction to Digital Communications. Cambridge University Press.
- Culler, J.D. (2011). Literary Theory: A Very Short Introduction. Oxford University Press.
- Austen, J. (2005). Pride and Prejudice. Oxford: Macmillan.

More readings and resources will be given prior to the start of the programme.

Business – Finance -Management (BFM) Module

01 | MODULE DESCRIPTION

How do financial systems work? How can AI-driven innovation fundamentally reshape business processes? What is the ' hidden human labor ' that powers AI? What is the true cost of unethical leadership in a global marketplace? What are the long-term strategic and social implications for the future of work and business?

"As you join us, you will have the opportunity not only to engage with a rigorous programme in Business, Finance, and Management, but also to situate your studies within the unique scholarly and cultural heritage of the University, reflected in its historic architecture and traditions."

Welcome Notes

This interdisciplinary module tackles these questions by bridging innovation, leadership, sustainability, and finance. It is designed to prepare students for the complexities of contemporary business by integrating topics like AI-driven transformation, strategic leadership, and wealth management. Students will explore how to lead responsibly and innovate effectively across diverse organisational contexts.

Drawing from fields as varied as extreme sports, banking, and sustainability, the course fosters a system-level understanding of how to navigate and shape the future of business. Through this approach, students will gain a comprehensive view of how different elements of a company interact to create value and drive change. Ultimately, this will equip students with the skills needed to make a significant impact in the world of finance and business.

The course is for students of:

Business, Economy, Finance, Accounting, Business and Public Administration, International Trade, Management, Marketing, other related fields and for students with strong interest in business matters.

Module Lead: Mr Mark Clark, MBE

Mark Clark's distinguished career spans over 30 years and multiple sectors. He served with both the British Army and the Foreign & Commonwealth Office, gaining extensive international experience in the UK, India, Iraq, Democratic Republic of Congo, Papua New Guinea, and Jordan.

02 | LEARNING OUTCOMES

Upon completion of this module, students will understand key macro- and microeconomic processes, as well as financial policy. They will be able to apply cutting-edge fintech tools, develop leadership skills, and discuss modern innovation practices. The module also provides insights into game theory strategies and executive compensation, preparing students to tackle complex business challenges.

03 | MODULE OVERVIEW

Unit 1: Leadership and Organisational Management: Theory and Practice

- Leadership: A Sporting Reflection
- Ultra Marathons: Strategic Management
- Responsible Leadership, Dynamic Strategies
- Workplace Motivation: Theory & Practice

Unit 2: Strategic Financial Management and Banking Systems

- Fintech: Examples, Uses, Benefits
- Financial Analysis and AI
- Sustainable Finance: Make Wise Decision
- Fundamental and Current Issues in Banking

Unit 3: AI and Technology: Transforming the Way we Work

- AI Driven Innovation: Shaping the Future
- Implementing AI in Business Processes
- AI for Circular Economies
- The Hidden Human Labour powering AI

Unit 4: Business and Sustainability: Transforming the World of Work

- Business and Social Impact
- Corporate Sustainability: Foundations
- Corporate Sustainability: Leadership
- Brand Management and Valuation

(This syllabus is a proposed framework. The curriculum is subject to annual review and will be updated to incorporate frontier academic topics and emerging advancements in the field.)

Proposed Reading List

- Mclaney, E.J. and Atrill, P. (2014). Accounting and Finance: An Introduction. New York: Pearson.
- Watson, T.J. (2006). Organising and Managing Work: Organisational, Managerial and Strategic Behaviour in Theory and Practice. Harlow: Pearson/Longman.
- Mazzucato, M. (2018). Value of Everything: Making and Taking in the Global Economy. S.L.: Public Affairs.
- Kay, J.A. (2011). Foundations of Corporate Success: How Business Strategies Add Value. Oxford: Oxford University Press.
- Hatch, M.J. and Cunliffe, A.L. (2006). Organization Theory: Modern, Symbolic, and Postmodern Perspectives. Oxford: Oxford University Press.
- Geroski, P. (2003). The Evolution of New Markets. Oxford: Oxford University Press.

More readings and resources will be given prior to the start of the programme.

New Frontiers of Science: Math, Physics, Computer Science and Engineering (STEM) Module

01 | MODULE DESCRIPTION

How will big data drive smart city innovation? How can AI enable stable, intelligent manufacturing of personalised products? What specific applications do Newtonian mechanics and fluid dynamics have for offshore renewable energy systems? In what ways will quantum computing change our understanding of astrophysics?

"*You will engage with a rigorous and intellectually stimulating programme that explores the frontiers of science, AI, engineering, and mathematics. This will be a distinctive opportunity to challenge yourself, broaden your perspectives across disciplines, and contribute meaningfully to addressing some of the most significant challenges of our time.*"

Welcome Notes

This module offers students an integrated introduction to key themes and innovations across the physical sciences, engineering, computing, and mathematics. Bridging theoretical principles with real-world applications, the module explores how interdisciplinary approaches help us understand complex systems, develop sustainable technologies, and harness computational power for innovation.

Students will explore foundational and advanced topics, including classical and fluid mechanics, network science, and climate modelling, alongside frontier areas such as AI-driven innovation, machine learning, and particle accelerator applications. Case studies such as supermassive black hole measurement, offshore renewable energy, and energy system transformation provide concrete insight into how STEM disciplines address contemporary global challenges.

The course is for students of:

Engineering related degrees, Material Science and Technology, Physics, Mathematics, Transportation, Space Science and Technology, Computer Science, Artificial Intelligence, etc.

Module Lead: Professor Martin Bureau

Professor Martin Bureau is a Lindemann Fellow and Tutor in Physics at Wadham College, as well as a Professor in Astrophysics at the University of Oxford's Department of Physics. Before joining Oxford, he was a NASA Hubble Fellow within the Department of Astronomy at Columbia University in New York City.

02 | LEARNING OUTCOMES

Upon completion of this module, students will be able to make critical scientific assessments of current issues and apply creative, solution-focused thinking to research. They will gain an understanding of our place in the universe, the future of quantum computing, and the principles of intelligent manufacturing. The module also covers the application of Newtonian mechanics in contemporary science and the process behind high-entropy materials.

03 | MODULE OVERVIEW

Unit 1: Advanced Mathematical Theories and Applications

- Advanced Probability Theory
- Combinatorics in Problem Solving
- Mathematical Modeling: Frontiers and its Applications
- Applications in Computer Science

Unit 2: Artificial Intelligence and Machine Learning

- AI and Machine Learning for Robotics
- Data, AI and the Future of Learning
- AI for Healthcare: Opportunities and Limitations
- Make Ethical Decisions: Ethics and AI

Unit 3: Theoretical and Experimental Physics

- Weighing Invisible Supermassive Black Holes
- Accelerators: Higgs Boson to Cancer Cure
- Nanotechnology: Engineering at Atomic Scale
- Tissue Engineering: Building Future Medicine
- Accelerators: Beyond Science, Diverse Applications

Unit 4: Sustainable Engineering Practices and Environmental Innovations

- Computational Fluid Mechanics: Offshore Energy
- Climate as a Mechanistic System
- Sustainable Energy Transport
- Shaping Future Energy Systems

(This syllabus is a proposed framework. The curriculum is subject to annual review and will be updated to incorporate frontier academic topics and emerging advancements in the field.)

Proposed Reading List

- Ashby, M.F. and Jones, D.R.H. (2012). Engineering Materials. 4th ed. Amsterdam: Elsevier Butterworth-Heinemann.
- Boas, M.L. (2015). Mathematical Methods in the Physical Sciences. New Delhi: Wiley. Chapters 1-2
- Stirzaker, D. (1999). Probability and Random Variables. Cambridge University Press.
- Borgnakke, Moran, M.J., Shapiro, H.N., Boettner, D.D. and Bailey, M. (2010). Fundamentals of Engineering Thermodynamics. John Wiley & Sons Canada, Limited.

More readings and resources will be given prior to the start of the programme.

Medical Science (MS) Module

01 | MODULE DESCRIPTION

What happens to the brain when we get older? Can stem cells be used to cure any disease? Is ultrasound useful for administering drugs? How can we ethically and effectively use advanced biomaterials? Can AI-driven drug design fully replace traditional methods? How can healthcare systems like the NHS or the US model adapt to new technologies?

"*We hope that the lectures and activities ahead will challenge you to think critically, inspire you to explore new perspectives, and strengthen your understanding of the medical sciences. This is also a chance to engage with your peers, share ideas, and appreciate the collaborative spirit that lies at the heart of medicine.*"

Welcome Notes

This module provides an insight into the latest topics in medicine and health-related subjects. Leading experts and researchers in the medical sciences will guide students through the intricacies of medical and clinical research, paying particular attention to cutting-edge technologies in a variety of medical areas.

Students will investigate process involved in the likes of neuroscience, oncology, surgery and immunology. Focus is also placed on advanced drug development and biomedicine, and how these are changing into the future. This course offers insight into the importance of interdisciplinary teamwork, to improve our medical knowledge and practice, as well as developing a comprehensive knowledge of framework and ethics in clinical practice, to develop as well-rounded physicians in the future.

The course is for students of:

Medicine, Genetics, Psychology, Public Health, Pharmacology and other related fields.

Module Lead: Professor Sir Walter Bodmer

Professor Sir Walter Bodmer is a renowned geneticist with a wide field of study. He is a Fellow of the Royal Society (FRS), an Honorary Fellow of the Royal Society of Edinburgh (HonFRSE), and a Fellow of the Academy of Medical Sciences (FMedSci).

02 | LEARNING OUTCOMES

Upon completion of this module, students will understand state-of-the-art tools and techniques in biomedical research, including nanotechnology and biomaterial manufacturing. They will explore ethical and regulatory issues and the importance of interdisciplinary teamwork. The module covers human health complexities in areas like oncology and neuropsychology.

03 | MODULE OVERVIEW

Unit 1: Medical Technology & AI

- AI and Medical Imaging
- Computer-Aided Drug Design
- Technology-Enhanced Drug Delivery
- Advanced Biomaterials & Therapeutic Technologies
- Integration of Proteomics and Genomics

Unit 2: Neuroscience & Disease Mechanisms

- Neurodegenerative Diseases (e.g., Parkinson's)
- Cognitive and Behavioral Neuroscience
- Psychology for Medicine
- Stem Cell Therapy

Unit 3: Oncogenesis & Regenerative Medicine

- Evolutionary Perspectives on Cancer and Aging
- Mechanisms Controlling Epigenetic Patterning
- Challenges in Cancer Therapy
- Using Biomarkers to Optimize Cancer Treatment
- Biomaterials for Tissue Engineering

Unit 4: Healthcare Systems & Medical Ethics

- Medical Research Ethics
- Healthcare System in the US
- NHS in the UK and The Impact of Covid-19

(This syllabus is a proposed framework. The curriculum is subject to annual review and will be updated to incorporate frontier academic topics and emerging advancements in the field.)

Proposed Reading List

- Siddhartha Mukherjee (2009). A Biography of Cancer. London: Fourth Estate Ltd. Part 1, 4 and 6
- Jones, S. (2012). The Language of the Genes. HarperCollins UK.
- Stryer, L., Berg, J., Tymoczko, J. and Gatto, G. (2023). Biochemistry. 10th ed. New York Macmillan Learning WH Freeman.
- Alberts, B. (2002). Molecular Biology of the Cell. 4th ed. New York: Garland Science Taylor & Francis. Chapter 9
- Bodmer, W.F. and Mckie, R. (1997). The Book of Man: The Human Genome Project and The Quest to Discover our Genetic Heritage. New York: Oxford University Press.

More readings and resources will be given prior to the start of the programme.

Partial List of Lecturers from Previous Programmes

Prof Jonathan Wolff

Blavatnik Chair in Public Policy and Governing Body Fellow at Wolfson College, University of Oxford. He has been an external member of the Board of Science of the British Medical Association. His recent work has largely concerned equality, disadvantage, social justice and poverty.

Alan Giles OBE

Associate Fellow at the Saïd Business School, University of Oxford, Chairman of the Advisory Board of the Oxford Institute for Retail Management, Non-executive director of the Competition and Markets Authority, Chairman of Fat Face, Chief Executive of HMV Group.Alan has taught on the Oxford MBA programme at Saïd Business School.

Prof Harish Bhaskaran

Professor of Applied Nanomaterials in the Department of Materials, EPSRC Fellow in Manufacturing. He is an inventor of phase change photonic computing and continues work in establishing the field. His work has been featured widely over the last several years in Science, Nature, The Economist, MIT Technology Review, Fortune, Wired, BBC etc.

Prof Robert Lambourne

Professor Emeritus in the Faculty of Science, Technology, Engineering and Mathematics at the Open University. Senior Vice-President at the Institute of Physics, Chair of the Physics Education Division of the European Physical Society and Chair of the International Commission on Physics Education.

Prof Ros Ballaster

Professor of 18th Century Studies and Lecturer in the Faculty of English and Tutorial Fellow at Mansfield College. Professor Ballaster was a Visiting Fellow to the Department of English and American Literature at Harvard University. Her main research areas encompass seventeenth-and eighteenth-century culture; oriental fiction; ideas of cognition and character in literary and theatrical representation.

Prof Harish Bhaskaran

Professor of Applied Nanomaterials in the Department of Materials, EPSRC Fellow in Manufacturing. He is an inventor of phase change photonic computing and continues work in establishing the field. His work has been featured widely over the last several years in Science, Nature, The Economist, MIT Technology Review, Fortune, Wired, BBC etc.

Prof Martin Bureau

Lindemann Fellow and Tutor in Physics at Wadham College, University of Oxford, and Professor in Astrophysics within the Department of Physics, University of Oxford. He is particularly interested in using observations and theoretical studies of the gas, stars, and dark matter that make up galaxies to constrain their formation and evolution.

Dr Tom Crawford

Fellow and Tutor at St John's College, Early Career Teaching and Outreach Fellow at St Edmund Hall, University of Oxford. Dr Crawford runs the award-winning website www.tomrocksmaths.com and has had partnerships with the European Mathematical Society. He can also be found on Numberphile - the largest maths education channel on YouTube with over 3 million subscribers.

Prof Sonia Antoranz Contera

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