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牛津展望计划

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牛津大学学院沉浸式学习

五大类跨学科学术模块选择

重量级行业特邀嘉宾讲座

英国顶级企业组织参访

留学指导助力申请世界顶尖大学

纯正英式社交拓展

英伦文化深度体验

项目简介 Programme Introduction

牛津大学是英语世界国家中最古老的大学，其授课历史可追溯至十一世纪末。2017-2023 年连续七年蝉联全球排名第一。

牛津大学拥有雄厚的师资力量，其教职队伍中有 83 位皇家学会会员和 125 位英国科学院院士。近 900 年的校史中，牛津于各个领域培养了许多杰出领袖，包括 6 位英国国王、30 位英国首相、多位外国政府首脑、70 余位诺贝尔奖获得者和一大批世界著名的文学家和科学家，在诸多领域引领着世界最前沿的科学研究。

牛津大学摄政学院全球发展与展望研究院（OPGDI）与学术界同仁团结一致，为来自精心挑选的一流中国合作高校的优秀学生设计线下跨学科学术访学项目。参与该项目的学生将前往牛津，亲身体验这所世界顶级学府的学习和生活。希望通过该项目，吸引全球最优秀的学生来到英国，近距离接触牛津，提供给每一位学生世界一流大学学习的机会，以此鼓励申请牛津大学注册访问学生课程（VSP），硕士课程及博士研究，同时为申请其他顶尖高校奠定坚实基础。



课程结构 Programme Structure

1.
跨学科学术课程
Academic Lectures

2.
学术实践工作坊
Academic Workshops

3.
行业特邀嘉宾讲座
Guest Lecture

4.
英国企业参访
Enterprise Visit

5.
英伦文化体验
Cultural Experience

6.
英式社交拓展
Social Activities

基本信息 Basic Information

申请条件： 合作高校在校本科生、硕士生（年龄 18-25 周岁），项目学术处将依据申请人英语能力、申请材料进行审核，或将安排面试，学术处将对录取结果拥有最终决定权。

考核评估： 由小组汇报展示，结业测试，和考勤等综合评定。

项目咨询： Wechat: oppadmin
Email: admin@oxford-prospects.com

课程结业： 将获得 Programme Certificate 与 Transcript Report。

01 : 跨学科学术课程 (五项选一) Academic Lectures

秉承牛津大学跨学科教学模式，开拓多领域研究思维。学术课程由 **5 大模块, 20 个领域**，以及 **90 余种议题** 组成。

课程师资为牛津大学各院系教授、学者，更有机会聆听英国四大学术院院士、行业特邀嘉宾亲自授课。

The
British
Academy

The Academy of
Medical Sciences

Royal Academy
of Engineering

THE
ROYAL
SOCIETY

政治 - 经济 - 哲学 - 法律

政经哲专业最初由牛津大学设立，后受诸多名校效仿，被誉为人文社科类最顶尖的专业，核心主旨在于通过几个不同角度和互补的学术方向，完整认识社会现象。此次课程内容将探索研究决策的含义，竞争性市场经济的后果，社会秩序的变化，以及当代世界的一系列相互依存的主题。

* 课程大纲及师资请参照 Page 11



STEM 前沿科学： 数学 - 物理 - 计算机 - 工程

大数据的使用将如何驱动“智慧城市”创新？低碳未来更好的能量源是什么？人工智能将如何助力“智能制造”实现个性化产品生产？量子计算机可实现自我复制吗？创新发生在各学科的交汇处，课程聚焦数学、物理、计算机及工程技术的前沿交叉应用，探讨科技成果转化的价值。

* 课程大纲及师资请参照 Page 17



文学 - 语言 - 数字文化 与传播学

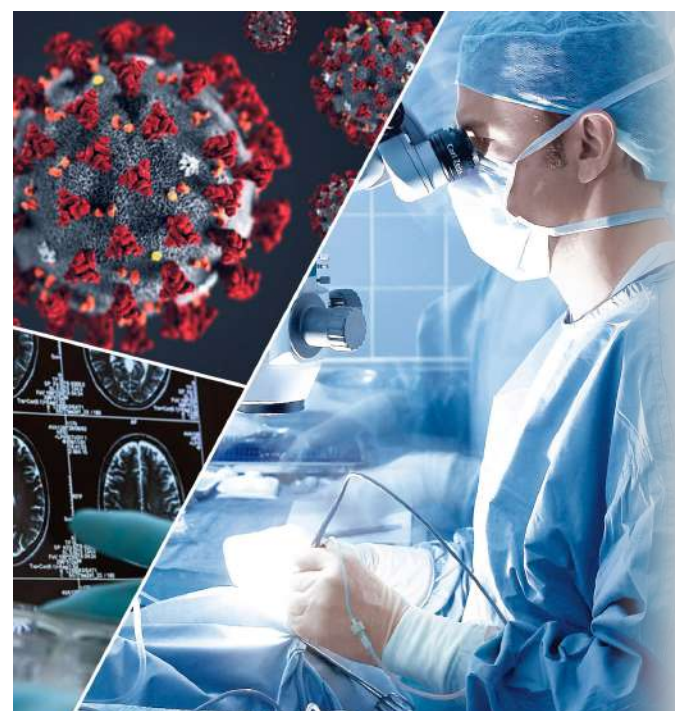
英剧唐顿庄园 (Downton Abbey) 的幕后有怎样的故事，在不同文化背景下的传播和接受度有什么样的区别？阅读可以成为理解和澄清自己思想的一种方式吗？新媒体数字文化是否正在改变我们的看法？在这一具有前瞻性的课程中，学生将专注于跨文化的各种交流媒体的基本信息。

* 课程大纲及师资请参照 Page 13

医学 (仅供医学类专业学生申请)

人为什么会得癌症？衰老时大脑会发生什么？干细胞可以用来治疗任何疾病吗？超声波对输药有用吗？抗生素会有危险？跨学科团队如何成为推进生物医学科学前进的唯一途径？该模块将探究错综复杂的医学和临床研究，基因编辑和肿瘤成像方面的最新技术发展，神经退行性疾病和肿瘤学的过程，并将分析临床试验和药物开发所需的步骤，提升更加全面的认知。

* 课程大纲及师资请参照 Page 19





02

学术实践工作坊 Academic Workshops

学术实践工作坊旨在激发学生的内驱力，锻炼批判性思维和研究技能，明晰学术和职业规划，同时还提供与牛津大学成功申请者互动，拓展人际关系的机会，内容包括：

- 科学研究方法论
- 个人陈述撰写
- 学术科研论文撰写
- 留学申请过程解读
- 学术演讲陈述技能
- 学术会议海报
- 牛津在读生及校友圆桌论坛
- 影视制作工作坊

03

行业特邀嘉宾讲座 Guest Lecture

项目过程中将安排一场重量级行业特邀嘉宾讲座，亲临分享行业洞见和思考。往期特邀嘉宾包括唐顿庄园总制片人，英格兰央行高管首席数据官，英国广播公司导演，英国知名摄影师，世界银行副行长，联合国委员等。

04

英国企业参访 Enterprise Visit

项目过程中将探访一家精心挑选的英国顶级企业组织。往期包括英国百年名企捷豹路虎(JLR)、Mini Cooper，ACCA总部，英格兰央行等，通过学习了解并学习这些企业从采购、生产到运营的每一个环节，加深对企业的认知，帮助规划未来职业发展。



05： 英伦文化体验 Cultural Experience

「感受牛津古城魅力」

深入牛津城，穿梭在历史久远的建筑中感受积淀厚重的牛津城魅力。参观并游览牛津城的著名景观，沉浸式体验中解读牛津韵味，世界上第一所公共博物馆阿什莫林博物馆，牛津自然历史博物馆，叹息桥（赫特福德桥）以及校友钱钟书先生所在学院等。

「探皇家秘境：温莎城堡」

温莎城堡作为英国王室温莎王朝的家族城堡，也是现今世界上有人居住的城堡中最大的一所，已故的英国女王伊丽莎白每年都会温莎城堡度过大部分时间。同学们将深度游览温莎城堡，揭开它的神秘面纱。

「伦敦行：古典 vs 现代」

来到英国，不可不去的伦敦之行。地标性的建筑大本钟，英国皇家官邸白金汉宫，首相府唐宁街十号，伦敦塔桥，英国议会，世界上历史最悠久、规模最宏伟的大英博物馆。

「造访莎士比亚故居」

参观莎士比亚故居，感受英式戏剧文化。英国时时处处都弥漫着浓郁的莎士比亚氛围，莎士比亚是文学史上充满传奇色彩的人物，像养料一样融入了英国文化的血脉。



06： 英式社交拓展 Social Activities



社交舞会 Gala Ball

社交舞会是牛津大学的传统社交活动。除了学习英式传统舞蹈，传统游戏娱乐，还有小食饮品，以及神秘的互动环节，与牛津的同学们一起留下在学习生活的美好记忆。



英式社交礼仪 + 下午茶 British Etiquette & Afternoon Tea

英国人如何问候寒暄？不同场合的穿着注意事项？都有哪些餐桌礼仪？除了学习英式社交礼仪，同学们还将体验传统英式下午茶。



牛津传统高桌晚宴 Formal Dinner

项目结束当晚举行结业典礼 (Certificate Award Ceremony)，体验牛津最传统的高桌晚宴，学生们将着正装出席，项目组也会颁发结业证书和优秀学员奖项，为两周的牛津学习生活画上完美的句号。



往期领衔教授 Past Lead Professors

课程各 Module 领衔教授来自于英国四大学术院：国家学术院，皇家学会，皇家工程院，医学科学院。

以下为往期领衔教授列表：

Professor Sir Richard Sorabji



英国国家学术院院士，
美国人文与科学院院士，
大英帝国勋章获得者，
爵士头衔。

Professor Duncan Gallie



英国国家学术院院士，
英国国家学术院副主席，
大英帝国勋章获得者。

Professor Avner Offer



英国国家学术院院士，
万灵学院荣誉教授。

Professor Sir Walter Bodmer



英国皇家学会院士，
爵士头衔。

Professor Graham Richards



英国皇家学会院士，
牛津大学化学系主席，
大英帝国勋章获得者。

Professor Sir Mike Brady



英国医学科学院院士，
英国皇家学会院士，
英国皇家工程院院士，
爵士头衔。

Professor Brian Cantor



英国皇家工程院院士，
大英帝国勋章获得者。

Professor Dame Frances Ashcroft



英国皇家学会院士，
英国医学科学院院士，
大英帝国勋章获得者，
女爵士头衔。

学生反馈 Student Testimonials

“**抵达牛津的瞬间，就被这座小城古朴厚重的历史底蕴所吸引**”

跨越 7 个小时时差，抵达牛津的瞬间，就被这座小城古朴厚重的历史底蕴所吸引，深深陶醉。项目组的老师都非常负责靠谱、和蔼可亲，耐心细致的照顾、安排我们每一天的充实行程。非常珍惜这两周在牛津的时光，我一定还会回来！

-- 李同学，上海交通大学本科一年级

“**英国古典和现代文化冲撞而产生的奇妙化学反应，让我深深留恋**”

这是我参与过最充实的项目，无论是学术课程的启迪，古老校园的震撼，还是英国古典和现代文化冲撞而产生的奇妙化学反应，都让我深深留恋。最后一天与老师还有同行的天南地北的小伙伴们道别，非常不舍，感谢牛津项目组周到、充实的安排，也祝福所有小伙伴一切顺利，未来很长，期待再次相遇。

-- 张同学，复旦大学本科三年级

“**课程所强调的学科交融理念给我带来了莫大启发**”

从 Christ Church 到 Blackwell，从大英博物馆到 Ashmolean，我们在每天充实的课程活动中收获良多，见识了不同的文化传统，不同的教学模式，以及不同的生活态度。课程所强调的学科交融理念给我带来了莫大启发，政治、经济、法律.....它们有趣，也总能与哲学本身交融在一起，让我对学科丰富性和深度都有了更多理解。

-- 黄同学，清华大学本科二年级

“**牛津之行让我更加独立、眼界更加开阔，我再一次成长了**”

没想到，之前照片上看起来遥不可及的伦敦大本钟配红色巴士竟变成了眼前一幕幕真实存在的光景，我也能在泰晤士河的游船上欣赏伦敦眼和塔桥风光，漫步在牛津街头，路过红色电话亭、海军蓝色门，欣赏两侧古朴典雅的建筑，牛津之行让我更加独立、眼界更加开阔，我再一次成长了。

-- 高同学，山东大学本科二年级

“**想象着先贤们也曾在在这个房间居住，无比感动，更无比敬畏**”

中学时有幸来牛津游玩了几天，当时没能深入学院学习，现在回看更像是个游客。而过去两周的时间，入住在古朴的学院里，与牛津大学的学生们同吃同住，同游同玩，特意查了这个学院的知名校友，想象着先贤们也曾在在这个房间居住，在同一个教室上课，穿梭过同一扇门，开过同一扇窗，无比感动，更无比敬畏。

-- 廖同学，华东师范大学本科二年级

“**原来做学术是如此纯粹，如此快乐的事情**”

在我印象里，那些学术界大牛都是可望不可及的存在，但在项目中，非常非常有幸能与牛津大学教授们面对面交流，甚至还见到了英国皇家工程院的两院院士！院士教授们在授课中表现出的谦虚客观，以及对我们提问的随和耐心，让我第一次感受到了，原来做学术是如此纯粹，如此快乐的事情。

-- 黄同学，北京师范大学本科二年级

“**来自不同学校的同学们相互合作，思想碰撞**”

不同领域的教授为我们讲授了人文社科领域多个学科的知识，教授们的授课或风趣幽默或严谨认真，让我们得以一窥人文学科的各种知识。我们不再局限于本专业，了解到走向更大世界的可能。我们的各项作业需要团队合作完成，来自不同学校的同学们相互合作，思想碰撞出的火花，为我们的选题制作带来了不一样的色彩。

-- 王同学，吉林大学本科一年级

“**没想到以往在电影、电视剧中才能看到的场景，如今我却有机会置身其中**”

舞会、英国传统礼仪、High Table 等等极具英国特色的内容，没想到以往在电影、电视剧中才能看到的场景，如今我却有机会置身其中。在学院学习和生活的两个星期，还访问了捷豹路虎工厂，充实的课程让我明白了‘Work Hard Play Harder’的牛津精神，让我感觉自己并不是参加了一个短期项目，更像是提前开始了留学生活。。

-- 林同学，厦门大学本科二年级

Syllabus Module PPEL

Politics-Economics-Philosophy-Law

政治 - 经济 - 哲学 - 法律

Proposed Topics

- Modern British Politics and Government
- Europe's Decade of Crises
- Re-engineering Social Security for the New Economy
- The Social Consequences of Unemployment
- Global Geopolitics
- Precedent in Legal Reasoning
- Human Right to Health
- Moral Philosophy, and Practical Ethics
- Words are Weapons: Lecture on Language in Politics
- British Constitutional Law
- Decline in Media Trust
- Philosophy of Leadership

This 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 Description

Do we all have the right to health? How much power does the Queen have? What characteristics should a leader in times of crisis have?

During this programme, students will appreciate our strong focus on philosophy, politics and international economics enriched by some insight into legal systems.

Examining the implications of decision-making, the consequences of competitive market economy and changes in social order, students will have the opportunity to explore a wide range of interdependent topics that shape the contemporary world.

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.

Learning Outcomes:

- Understand the intricacies of UK and global politics for international relations, employment, poverty and inequality.
- Gain insight into the philosophy of leadership and how it relates to practical ethics.
- Have an understanding of international economy in the perspective of employment and social development.
- Be introduced to different types of research in social sciences and comprehend how international organisations shape our reality.
- Comprehend the link between theory and practice in legal systems and global geopolitics.

Proposed List of Lecturers (Partial)

■ Prof. Sir Richard Sorabji

Fellow of British Academy, Fellow of the American Academy of Arts and Sciences, Commander of the British Empire. He has published 15 books, edited or co-edited 11 and provided two book-length series of interviews. Prof. Sorabji's writing on Philosophy and its History covers three main areas: the physics of the universe, the mind and social and ethical problems.



■ Prof. Duncan Gallie

Fellow of British Academy, Commander of the British Empire, Fellow of Nuffield College, Professor of Sociology in the University of Oxford. He has advised the French government as a member of an expert group on psychosocial risks at work. He served as Vice-President Social Sciences and then as Foreign Secretary and Vice President of the British Academy .



■ Prof. Paul Craig

Emeritus Professor of English Law, Fellow of the British Academy. He was appointed an honorary Queen's Counsel. Professor Craig does most of his teaching and research in Constitutional and Administrative Law, and European Community Law and is currently engaged in a project which brings all of these subjects together.



■ Prof. Avner Offer

Fellow of the British Academy, Emeritus Fellow of All Souls College. He has published on international political economy, law, the First World War, and land tenure. Professor Avner studies the origins, attributes, and drivers of market liberalism, its successes, failures, and prospects. Currently he is studying the transition from Social Democracy to Market Liberalism.



■ Prof. David Rueda

Professor of Comparative Politics at Nuffield College. Received numerous research awards, including a British Academy Research Development Award (2008-2010). Author of Social Democracy Inside Out (Oxford University Press, 2007) and Who Wants What? Redistribution Preferences in Comparative Perspective (Cambridge University Press, 2019).



■ Prof. Jonathan Wolff

Blavatnik Chair in Public Policy and Governing Body Fellow at Wolfson College. Formerly Professor of Philosophy and Dean of Arts and Humanities at UCL. 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.



■ Prof. Micheal Freedon

Emeritus Professor of Politics. Sir Isaiah Berlin Prize for Lifetime Contribution to Political Studies by the UK Political Studies Association. Fellow of the Academy of Social Sciences. His main interest is in the study of actual political thinking at various levels of articulation.



Syllabus Module LLD

Literature, Language, Digital Culture and Communication

文学 - 语言 - 数字文化与传播学

Module Description

Ever wondered what happens behind the scenes of the most successful British show worldwide of all time - Downton Abbey? Could reading classics be a way of understanding and clarifying our own thinking? Is digital culture changing and shaping our perception?

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 are going to focus on the underlying messages of various media of communication across cultures and will look at femininity and the representation of women, in particular.

From Shakespearean tragedies and Jane Austen's novels analysed and critically examined from academic as well as performing arts angles, through film experts to digital media and society, students will have the opportunity to engage with the latest research in literature, language and intercultural communication.

Learning Outcomes:

- Understand the different approach to literary analysis in the West.
- Have experience in critical analysis of literary texts and visual arts using different theoretical approaches.
- Look in detail at canonical texts by Shakespeare and Jane Austen in their original context.
- Gain insight into cultural appropriation and representations of China in English literature.
- Become familiar with the major trends in digital cultures, modern scholarship and interdisciplinary studies
- Become acquainted with and aware of varying aspects of intercultural communication and try creative writing first-hand.

Proposed Topics

- Representations of China in Eighteenth-Century English Literature
- Intricate Workings behind the Scenes of Downton Abbey
- Feminist History and the History of the Body
- Self-presentation in the Digital Age: Collapsed contexts, fragmented identities, and risks of the lowest common denominator
- Languages, Dialects and Varieties
- An Introduction to World and Postcolonial Literatures
- Film and Gender
- The Language of 'Romeo and Juliet'
- Language and the Practice of Persuasion
- Creative Writing
- Jane Austen, Pride and Prejudice, and the Courtship Novel
- Languages Don't Change, People Change Languages

This 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.

Proposed List of Lecturers (Partial)

■ 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. Katherine Paugh

Fellow and Tutor at Corpus Christi College, Associate Professor of Atlantic World Women's History at the Department of History, University of Oxford. Her work as an historian has focused primarily on understanding how the political and economic imperatives of empire have shaped cultural visions of race, class, gender, and the body during the seventeenth through nineteenth centuries.



■ Ms Liz Trubridge

Film director and television producer mostly known for her role as Executive Producer of Downton Abbey. She has won many awards for her work, including a Primetime Emmy, a BAFTA and a Golden Globe. Downton Abbey aired on UK television between 2010 and the end of 2016. It is the most successful British show worldwide of all time and has won many awards around the world.



■ Prof. Lynda Mugglestone

Professor of the History of English, Tutorial Fellow at Pembroke College, Lecturer in English Language at Trinity College, University of Oxford, Governor of Samuel Johnson's House museum in London. Her current research, for which she was awarded a Leverhulme Research Fellowship explores linguistic evolution during war-time.



■ Dr Clare Morgan

Director, Master of Studies in Creative Writing, Department for Continuing Education, Fellow of Kellogg College, the Chair of the Literature Bursaries Panel for the Arts Council of Wales. Dr Morgan is a novelist and short story writer, whose interdisciplinary research interests currently focus on creative writing, and on the relation between literature and business.



■ Dr James Painter

Director of Journalism Programme at Reuters Institute for the Study of Journalism. He has carried out several consultancies for the IPCC, IPBES, Oxfam, UNDP, Conservation International and other organisations. James joined the BBC World Service in 1992, and worked as head of the Spanish American Service, head of the BBC Miami office, and Executive Editor Americas.



■ Dr Peak Krafft

Senior Research Fellow at the OII in the University of Oxford's Social Science Division. Dr. Krafft's research, teaching, and organizing aim to bridge computing, the social sciences, and public interest sector work towards the goals of social responsibility and social justice. Dr. Krafft's research interests include Sociotechnical systems, digital institutions, online laboratory experiments, sociotechnical systems, etc.



Syllabus

Module BFM

Business, Finance and Management

金融 - 商科 - 管理

Proposed Topics

- The British Economy - Yesterday, Today, Tomorrow
- Business in Post-Covid World
- Applications of Game Theory to Real World
- Investment Banking
- Financial Crisis: Causes and Policy Issues
- Corporate Finance
- Strategic Foresight
- Sustainable Accounting
- Workplace Psychology and Leadership
- Digital Finances and FinTech

This 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 Description

Have you ever wondered how financial systems work or how much a company is worth? Are interactions more important than processes? Can we live without money?

This module is for students interested in understanding the impact of business on our globalised world, curious about financial processes, sustainable accounting, and digital transformation. This course will give you a deeper insight into workplace psychology and developing leadership skills. Led by distinguished professors, students will gain a deeper insight into quantitative economics, investment banking, game theory, innovation, labour markets, political economy of international business and the challenges posed by multi-level systems. The interdisciplinary approach of the course will stimulate students to critically reflect on the surrounding world, market mechanisms, policy options, innovation as well as global leadership and entrepreneurship in the 21st century.

Learning Outcomes:

- Improve understanding of macroeconomic process.
- Become aware of design thinking steps.
- Be able to identify latest fintech tools.
- Gain insight into foundations of financial stability policies.
- Master the most common game theory strategies.
- Be able to discuss the complexities of executive compensation.

Proposed List of Lecturers (Partial)

■ Prof. Duncan Gallie

Fellow of British Academy, Commander of the British Empire, Fellow of Nuffield College, Professor of Sociology in the University of Oxford. He has advised the French government as a member of an expert group on psychosocial risks at work. He served as Vice-President Social Sciences and then as Foreign Secretary and Vice President of the British Academy .



■ Prof. Avner Offer

Fellow of the British Academy, Emeritus Fellow of All Souls College. He has published on international political economy, law, the First World War, and land tenure. Professor Avner studies the origins, attributes, and drivers of market liberalism, its successes, failures, and prospects. Currently he is studying the transition from Social Democracy to Market Liberalism.



■ Prof. Nir Vulkan

Fellow of Worcester College, Director of the Oxford Programmes on Fintech; Blockchain Strategy; and Algorithmic Trading, Chair of the Committee set up to advise the European Commission on AI in Banking and Finance. Professor Vulkan is a leading authority on e-commerce and market design, and on applied research and teaching on hedge funds.



■ Prof. Petr Sedlacek

Professor and Tutor in Economics at Christ Church College, and a Research Fellow at the Centre for Economic Policy Research. Professor Sedlacek is also Principal Investigator for the Entrepreneurs, Firms and the Macroeconomy research project, for which he has been awarded a Starting Grant of the European Research Council.



■ Prof. Richard Barker

Professor of Accounting at the Saïd Business School. He has education from both the University of Oxford and University of Cambridge, and he qualified as a chartered management accountant while working for AstraZeneca. He is the academic member of the Corporate Reporting Council, which sets UK accounting standards.



■ 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. Andrea Ferrero

Professor in the Department of Economics at the University of Oxford and the Levine Fellow in Economics at Trinity College, where he teaches undergraduate and graduate macroeconomics. He is currently an academic consultant for the Bank of England and was a consultant the Norges Bank between 2014 and 2016.



Syllabus Module STEM

New Frontiers of Science: Maths, Physics,
Computer Science and Engineering
STEM: 数学 - 物理 - 计算机 - 工程

Module Description

How will big data drive future smart city innovation?
How will Artificial Intelligence enable rapid and stable intelligent manufacturing of personalised products?
How do we design bridges? Is maths useful for sports?
Will robots fully mimic humans?

Students will explore ways to apply creative reasoning and science to solve real problems while crossing traditional boundaries of disciplines. As disciplines converge into new hybrid fields students engage with the highest-level academicians and leading experts who invent and research the cutting-edge solutions of the modern world. This programme focuses on practical aspects of mathematical modelling, physics and engineering, asks questions about the worth of technology transfer and encourages students to find missing links between everyday phenomena.

Learning Outcomes:

- Have the requisite knowledge and understanding to make their own critical scientific assessments of current issues.
- Develop critical thinking skills necessary for mathematical modelling.
- Develop an understanding of the scale of the Universe.
- Describe and apply the principles of intelligent manufacturing.
- Gain insight into the future of quantum computing and optimisation of robotics.
- Comprehend the historical evolution of Newtonian mechanics and its place in contemporary world as well as in the future.
- Investigate the multitude of high entropy materials.

Proposed Topics

- Multicomponent High-entropy Materials – Cantor Alloys
- Mathematical Modelling: Art of Problem Solving
- Renewable Energy for a Low-carbon Future
- Conservation laws. Noether's Theorem
- Particle Accelerators: From Making Higgs Bosons to Curing Cancer
- Human-AI Interaction: Digitalisation and Collective Action
- Transportation: Future Powertrains
- Intelligent Manufacturing of Personalised Products
- Modelling Sports Dynamics
- The Role of Big Data in a Smart City
- The Dark Side of the Force: Dark Energy and Dark Matter

This course is for students of:

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

Proposed List of Lecturers (Partial)

■ Prof. Sir Mike Brady

Fellow of the Royal Society, Fellow of the Royal Academy of Engineering, Fellow of the Academy of Medical Sciences, Professor in the Department of Oncology. Professor Brady was Deputy Chairman of Oxford Instruments plc from 1994 to 2014. He was awarded the Faraday Medal for the year 2000, and a Third Millennium medal of the IEEE.



■ Prof. Artur Ekert

Fellow of the Royal Society, Professor of Quantum Physics at the Mathematical Institute, University of Oxford. He was awarded the 1995 Maxwell Medal and Prize by the Institute of Physics, the 2007 Hughes Medal by the Royal Society and the 2019 Micius Quantum Prize. His research extends over most aspects of information processing in quantum-mechanical systems.



■ Prof. Brian Cantor

Fellow of the Royal Academy of Engineering, Commander of the British Empire. Professor of Materials in the Department of Materials, Former Vice-President of the Royal Academy of Engineering. He was awarded the Rosenhain and Platinum Medals of the Institute of Materials, Minerals and Mining. He has published over 300 papers and books, given over 100 invited talks in more than 15 countries.



■ 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.



■ 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. Dino Sejdinovic

Professor at the Department of Statistics, Turing Fellow of the Alan Turing Institute. He is broadly interested in statistical foundations underpinning large-scale machine learning algorithms. Professor Sejdinovic conducts research at the interface between machine learning and statistical methodology with a focus on kernel and nonparametric methods.



■ 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.



■ Prof. Felix Leach

Fellow and Tutor in Engineering Science at Keble College, University of Oxford, Associate Professor of Engineering Science, Fellow of the Higher Education Academy, Member of the Society of Automotive Engineers. His research interests are in Combustion, and specifically emissions and efficiency in internal combustion engines.



Syllabus

Module MS

Medical Sciences

医学

Proposed Topics

- Medical Artificial Intelligence Vision
- Haematopoiesis: from Normal to the Disease State
- Macrophage & Anti-microbial Activity
- Computer-aided Drug Design
- Flash Radiology
- Drug Development and Clinical Trials
- Cell biology: Evolutionary Perspectives on Cancer and Ageing
- Neurodegenerative Diseases: the Coming Epidemic
- Biomedical Engineering: Tissue Reconstruction and Angiogenesis
- Deep Brain Simulation and Testing
- Autoimmune Diseases and Checkpoint Therapy
- Quantifying Parkinson' s Disease and Digital Phenotyping
- Is Vision Driven by the Eye or the Brain?
- Extracellular Vesicles in Health and Disease
- Vascular Pharmacology

This course is for students of:

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

Module Description

Why do people get cancer? What happens to the brain when we get older? What is checkpoint therapy? Can stem cells be used to cure any disease? Is ultrasound useful for administering drugs? Antibiotics – can they be dangerous?

This module provides an insight into the hottest topics in medicine and health related subjects. The greatest brains in the field will guide the students through the intricacies of medical and clinical research, paying particular attention to the latest technology developments in gene-editing and oncological imaging. Students will investigate the processes involved in neurodegenerative diseases and oncology as well as will analyse the steps necessary in clinical trials and drug development. The course offers a preview of how interdisciplinary teams are the only way to advance biomedical sciences and offers a comprehensive framework in translational medicine. Students will also examine various models of healthcare systems and clinical practice to become more aware and better informed physicians.

Learning Outcomes:

- Develop understanding of the state-of-the-art tools and techniques in biomedical research.
- Appreciate the importance of interdisciplinary teams in cutting-edge developments.
- Explore the ethical and regulatory issues in research.
- Understand the complexities of cancer research and neurodegenerative diseases.
- Have insight into the role of nanotechnology in biomedical applications such as vaccinations, drug delivery or cell cultures.
- Gain understanding of biomaterial manufacturing processes and its role in regenerative medicine.
- Discuss various aspects of inflammatory processes in body.

Proposed List of Lecturers (Partial)

■ Prof. Graham Richards

Fellow of the Royal Society, First Chairman of Chemistry at the University of Oxford. He also founded Oxford Molecular, a scientific software company that at its peak was worth £450m and helped set up Oxford University Innovation, Oxford's technology transfer company that has brought approximately 60 spin-out companies into existence.



■ Prof. Sir Mike Brady

Fellow of the Royal Society, Fellow of the Royal Academy of Engineering, Fellow of the Academy of Medical Sciences, Professor in the Department of Oncology. Professor Brady was Deputy Chairman of Oxford Instruments plc from 1994 to 2014. He was awarded the Faraday Medal for the year 2000, and a Third Millennium medal of the IEEE.



■ Prof. Sir Walter Bodmer

Fellow of the Royal Society, Honorary Fellows of the Royal Society of Chemistry, Fellow of the Academy of Medical Sciences, Professor of Genetics in the Department of Oncology (Medical Sciences Division) at the University of Oxford, and Head of the Cancer and Immunogenetics Laboratory at the MRC Weatherall Institute of Molecular Medicine, Oxford.



■ Prof. Sonia Antoranz Contera

Professorial Fellow of Green Templeton College, and a Professor of Biological Physics at the University of Oxford Physics Department. Her work lies at the interface of physics, biology, and nanotechnology. She was the founder, director and co-director of the Oxford Martin Institute of Nanoscience for Medicine at the Oxford Martin School.



■ Prof. Robert Carlisle

Fellow of St Cross College, Associate Professor in Biomedical Engineering, Director of MSc in Nanotechnology for Medicine and Healthcare, Associate Director of Synthetic Biology CDT. The majority of Bob' s work has been concerned with achieving systemic delivery of anti-cancer agents for the treatment of metastatic cancer.



■ Prof. Chrystalina Antoniadou

Official Fellow of Reuben College, Associate Professor of Neuroscience in the Nuffield Department of Clinical Neurosciences at the University of Oxford, the Chair of the Clinical Neurosciences Society. Professor Chrystalina Antoniadou's interest lies in examining the neurobiological relationship between visual perception and art.



■ Prof. Dame Frances Ashcroft

Dame Commander of the Order of the British Empire, Fellow of the Royal Society, Fellow of the Academy of Medical Sciences, Research Professor in the Department of Physiology, Anatomy and Genetics at the University of Oxford, Professorial Fellow of Trinity College, University of Oxford. Her research focuses on ATP-sensitive potassium (KATP) channels.



