

MSc Scientific Computing with Data Science

Overview

Are you a recent graduate in a Physical or Life Science who would like to learn more about computing and how it is applied to advance scientific research? This programme will help you achieve your goals. Join a Faculty whose Schools all ranked in the top 5 for research quality in the UK (THE analysis of REF 2021). Develop your skills in coding, machine learning and high-performance computing and learn how to apply these to cutting-edge computational problems drawn from across the sciences.

你是一名物理或生命科学专业的应届毕业生吗?你想了解更多关于计算及其如何应用于推进科学研究的知识吗?这个课程将帮助你实现你的目标。加入一个在英国研究质量排名前5的学院(REF2021的分析)。开发您在编码、机器学习和高性能计算方面的技能，并学习如何将这些应用于来自各个科学领域的前沿计算问题。

Scientific computing is an interdisciplinary field that uses computer science, data science and digital technology to solve problems across a wide range of subject areas, including maths, engineering, biology, physics, chemistry, geography and earth sciences. Whatever your scientific background, this programme will train you in coding and data science, building on your core scientific knowledge and giving you a robust appreciation of what can be achieved by combining these skills.

科学计算是一个跨学科的领域，它使用计算机科学、数据科学和数字技术来解决广泛学科领域的问题，包括数学、工程、生物、物理、化学、地理和地球科学。无论你的科学背景是什么，本课程将在编码和数据科学方面对你进行培训，建立在你的核心科学知识的基础上，并让你充分认识到通过结合这些技能可以实现什么。

You will master modern programming languages, data science and machine learning algorithms, and apply them to problems in your chosen science. You will understand the main software engineering concepts and principles involved in scientific computing and data science and use them to model complex scientific systems, giving you an edge in a competitive and fast-changing labour market. Through project work, industrial networking and visits, you will have opportunities to build contacts, opening up additional job opportunities once qualified.

你将掌握现代编程语言、数据科学和机器学习算法，并将它们应用于你所选择的科学中的问题。您将了解科学计算和数据科学中涉及的主要软件工程概念和原则，并使用它们为复杂的科学系统建模，使您在竞争激烈和快速变化的劳动力市场中获得优势。通过项目工作、行业网络和访问，你将有机会建立联系，一旦合格就会获得额外的工作机会。

Most of your core teaching will be delivered by academics linked to Bristol Scientific Computing (BriSC), who are based in the Faculty of Science. BriSC brings together experts from across the University whose teaching and research focus on applying the latest computational techniques to key scientific problems, such as changes in the earth's atmosphere, the reactions of molecules or how galaxies are formed. The learning of programming languages and computational techniques is most effective when it is practice-based. Therefore, the computing units in this programme are mainly delivered through interactive workshops and student-led activities, supported by seminars and tutorials.

您的大部分核心教学将由理学部布里斯托科学计算(BriSC)相关的学者提供。BriSC汇集了来自整个大学的专家，他们的教学和研究重点是将最新的计算技术应用于关键科学问题，如地球大气的变化，分子的反应或星系是如何形成的。编程语言和计算技术的学习以实践为基础是最有效的。因此，本课程的计算单元主要是通过互动工作坊和学生主导的活动，辅以研讨会和辅导课。

The MSc in Scientific Computing with Data Science builds on the University of Bristol's unique strengths and facilities as a world-class centre for [supercomputing](#), [data science](#) and data-intensive research. 科学计算与数据科学理学硕士课程建立在布里斯托大学作为超级计算、数据科学和数据密集型研究的世界级中心的独特优势和设施之上。

Programme structure

This programme will admit students with any scientific background. Prior computing experience is useful but not essential; you will be streamed according to your computing knowledge to bring everyone to the same level at the end of your initial coding course.

You will take 80 credit points of compulsory units covering:

- Scientific programming using modern interpreted and compiled languages 使用现代解释和编译语言进行科学编程
- Research software engineering best practice, including version control, modern programming environments and testing 研究软件工程最佳实践，包括版本控制、现代编程环境和测试

- Data analysis methods including data manipulation and cleaning, regression and machine learning 数据分析方法包括数据操作和清理、回归和机器学习
- Data visualisation 数据可视化
- Numerical methods 数值方法

In addition, you will carry out a 20 credit point group project, applying coding and data analysis to problems set by industrial and academic partners, as well as choosing additional credits from a range of final year options from our undergraduate programmes (depending on your qualifications and timetabling). 你将完成一个20学分的小组项目，将编码和数据分析应用于工业和学术合作伙伴设置的问题，以及从我们本科课程的最后一年选项中选择额外的学分(取决于你的资格和时间表)。

To complete your studies, you will carry out a 60 credit point individual research project, which you can choose from a selection proposed by project supervisors. This project will provide you with first-hand experience in planning, running, documenting, and presenting a substantial piece of original work, applying your computing skills to a cutting-edge challenge in science.

为了完成你的学业，你将进行一个60学分的个人研究项目（导师提供课题选择）。该项目将为您提供规划、运行、记录和呈现大量原始工作的第一手经验，将您的计算技能应用于科学中的前沿挑战。