

COMPUTING, DATA SCIENCE AND MATHEMATICS

At Stirling, we combine cutting-edge research in predictive modelling and data science with their application in multiple areas.

We explore the connections between computer science, mathematics, life sciences, social sciences and management. Our interdisciplinary research environment enables computer scientists and mathematicians to work together on solving challenging problems in food and health, the environment, business and social organisation.

Demand for data scientists and analysts is on the rise and employers require skills such as scripting languages, big data, SQL databases and machine learning to interpret big data and apply it in practice. Our courses have been developed in partnership with organisations to fill this gap and prepare the data scientists of the future.

We work collaboratively with a number of organisations, including The Data Lab, Scotland's Data Science Innovation Centre, that supports students with funding, networking and routes to employment, and the Scottish Informatics and Computing Science Alliance (SICSA), to ensure our students have the best platform to succeed.

RESEARCH COURSES

Research excellence underpins all we do. As part of our research community, you will contribute innovative, practical and applied solutions to the challenges facing society today.

We offer research options, including PhDs, in the following areas:

- Fintech
- Blockchain technologies
- Computational heuristics
- Artificial intelligence
- Clinical decisions support systems
- Process algebra
- Computational intelligence and machine learning
- Data mining
- Modelling and analysis of complex systems

Many of our courses offer multiple start dates, please check course webpages for details.



Full-time course



Part-time course



To find out more about identifying a supervisor and submitting a research proposal, visit: stir.ac.uk/research

ARTIFICIAL INTELLIGENCE



Campus based
MSc, PG Dip, PG Cert

Artificial Intelligence (AI) is revolutionising sectors such as marketing, finance, sport, manufacturing, healthcare and government. It is also a skill highly sought-after by tech giants including Google, Facebook and Amazon.

This course covers the theoretical underpinning of a wide variety of AI-related techniques, including machine learning and deep learning, mathematics and statistics for data science, programming using Python, computer vision and natural language processing. The course also covers the technology, techniques, tools, software and methodologies used to apply these underlying theories to real-world problems.

You will have the opportunity to work with academics on ongoing commercially-relevant research projects and also take part in placement projects with industry or technology providers.

Our MSc Artificial Intelligence course achieved 93% overall student satisfaction at the latest Postgraduate Taught Experience Survey (PTES) 2022.

CORE MODULES

- Mathematical Foundations
- Statistics for Data Science
- Representing and Manipulating Data
- Commercial and Scientific Applications
- Machine Learning
- Deep Learning for Vision and NLP
- Stochastic Processes and Optimisation
- Dissertation or a Summer Project in partnership with a company or technology provider

[Check course web page for optional modules](#)

CAREER PROSPECTS

Graduates with an AI qualification will find employment in sectors such as: business or customer analytics, robotics, advanced healthcare, financial technology (fintech), legal technology (lawtech), automotive (self-driving cars), cyber security and social media.

DID YOU KNOW?

Our course was designed in collaboration with employers to ensure that Stirling students have the relevant skills to meet the sector's demand, preparing industry-ready graduates.

Course Starts: September and January



BIG DATA



Campus based
MSc, PG Dip, PG Cert

Big data is increasingly important in today's commercial landscape and these skills are in high demand.

Scotland is a growing and dynamic country with an exciting future at the heart of the data science revolution. Recently, more than £660 million has been invested in the vision of turning our capital city, Edinburgh, into the 'Data Capital of Europe' (Source: Scottish Development International, 2020).

The MSc Big Data is an advanced Masters course covering the technology of big data and the science of data analytics.

As a data scientist specialising in big data, you will help companies make sense of large amounts of data, providing rapid insights that enable them to make better, quicker decisions. The course will also teach you how to collect, manage and analyse big, fast-moving data for science or commerce through cutting-edge technology such as Data Analytics, R, Hadoop, NoSQL and Machine Learning.

The Stirling Masters has been developed in partnership with companies that employ data scientists and includes the possibility of an internship that will enable you to make industry connections that could benefit your future career.

CORE MODULES

- Mathematics and Statistics for Data Science
- Representing and Manipulating Data in Python
- Relational and Non-Relational Databases
- Commercial and Scientific Applications
- Machine Learning
- Cluster Computing
- Dissertation or a Summer Project in partnership with a company or technology provider

[Check course web page for optional modules](#)

CAREER PROSPECTS

As a graduate in Big Data you'll be able to work in a wide range of sectors such as digital technologies, energy and utilities, financial services, public sector and healthcare.

Our graduates have found employment with data solutions consultancy companies such as bigspark, the NHS, the Scottish government, The Data Lab and many more.

DID YOU KNOW?

Big data professionals earn on average 31% more than other IT professionals in the industry.

Course Starts: September and January



BIG DATA (ONLINE)



Online
MSc

The MSc Big Data is an advanced Masters degree covering coding skills, the technology of big data and the science of data analytics.

This is a two-year online course with three entry points throughout the year giving you the flexibility of start date and an opportunity to study in a way that suits your personal and professional needs through a combination of video lectures, live sessions and online materials.

The syllabus includes topics such as Python scripting, big databases and NoSQL, Cluster Computing and Mathematics and Statistics for Big Data.

On this course, you will be able to take Microsoft accredited courses in addition to your academic study, free of charge.

CORE MODULES

- Commercial and Scientific Applications
- Statistics with R
- Personal and Professional Development
- Relational and non-Relational Databases
- Machine Learning
- Mathematical Foundations
- Representing and Manipulating Data
- Cluster Computing
- Dissertation

[Check course web page for optional modules](#)

CAREER PROSPECTS

Big data is a skill set that is in high demand. This Masters has been developed in partnership with companies that employ Data Scientists and as a graduate in big data you'll be able to command a salary that is typically higher than the IT average.

Our big data graduates have gone into a wide range of sectors such as digital technologies, energy and utilities, financial services, public sector and healthcare.

Course Starts: October, February and May



FINANCIAL TECHNOLOGY (FINTECH)



Campus based
MSc, PG Dip, PG Cert

Fintech is taking over the banking and finance industry and introducing a whole new set of ideas and opportunities in business, finance, technology and society.

Our MSc Financial Technology is one of the first offered in the UK. The course provides you with a solid foundation in computing, financial theory, ethical and regulatory constraints, and business skills. Our Masters course covers topics and technologies from big data and analytics, computing for finance, blockchain and digital currencies, mobile computing and modern financial services.

We equip our graduates with the latest knowledge and skills required to work in the fintech sector, with a multi-disciplinary approach open to students with both computing/engineering and finance/economics background.

Scotland is home to more than 140 fintech companies and is the second largest fintech hub after London, employing more than 160,000 people in the financial services sector.

This course has been developed in partnership with global organisations specifically to provide the skills that employers in the fintech industry need.

You will develop an independent project on cutting-edge developments in the sector, either in collaboration with industry, or on applications or research topics.

CORE MODULES

- Blockchain Technologies
- Cyber Security
- Bank Theory, Operations and Strategy
- Machine Learning
- Mobile Financial Applications
- Dissertation or a Summer Project in partnership with a company or technology provider

[Check course web page for optional modules](#)

CAREER PROSPECTS

Fintech is a growth sector in its own right and there are opportunities across the career spectrum from new and exciting start-up companies to established banks and insurance companies.

DID YOU KNOW?

Companies such as HSBC, Sainsbury's Bank, JP Morgan and MBN helped us shape the course with employability firmly in mind.

Course Starts: September and January



MATHEMATICS AND DATA SCIENCE



Campus based
MSc, PG Dip, PG Cert

The COVID-19 pandemic has shown the importance of combining Data Science and Mathematics, with governments around the world being guided by predictions from mathematical models.

Our MSc Mathematics and Data Science course is one of the first courses to link these two key areas, making it uniquely positioned to meet the demand for these skills, giving you a practical application in financial, business and medical systems, as well as the tools for studying data networks.

There is a global shortage of qualified analysts, and in particular, the demand is for graduates who can both manage the data (computing skills), and analyse the data to extract patterns, build models and make predictions (mathematics skills).

This Masters course will provide you with vital skills and knowledge in mathematical modelling, including applications and techniques used in many areas, from logistics and financial industries to healthcare and academia. You will learn through real-life applications and hear from external speakers about how big data is used in industrial and scientific applications.

Our MSc Mathematics and Data Science course achieved 100% overall student satisfaction at the latest Postgraduate Taught Experience Survey (PTES) 2022.

CORE MODULES

- Networks and Graph Theory
- Mathematical Modelling in Financial and Medical Applications
- Representing and Manipulating Data
- Stochastic Processes and Optimisation
- Machine Learning
- Commercial and Scientific Applications
- Dissertation or a Summer Project in partnership with a company or technology provider

[Check course web page for optional modules](#)

CAREER PROSPECTS

Graduates who are skilled in data science and mathematics are in high demand. Our graduates have gone on to work in financial institutions, energy firms, sport and fitness, start-ups, NHS and pharma, environmental agencies, government agencies, as well as gone on to undertake PhDs in the UK and overseas.

THE PLACE TO BE

Scotland has become a data science hub with students and start-up companies benefiting from organisations such as The Data Lab and CodeBase.

Course Starts: September and January





**PROFESSOR
KEVIN SWINGLER
HEAD OF DIVISION,
COMPUTING SCIENCE
AND MATHEMATICS**

Professor Kevin Swingler is Head of the Division of Computing Science and Mathematics and was responsible for developing the Masters courses in Big Data, Fintech and Artificial Intelligence at Stirling.

SKILL SHARE

What are the key differences between big data, artificial intelligence and financial technology?

We take a data-driven approach to Artificial Intelligence (AI) and Financial Technology (Fintech), so these courses share material such as Python scripting and machine learning. Big Data is more focused on technology - such as databases, scripting, machine learning and cluster computing - than Fintech, which has a focus on finance, banking and entrepreneurship.

The computing part of the Fintech course is about cybersecurity, mobile apps and blockchain. Artificial Intelligence does not cover technology such as databases, but has a focus on giving computers human like abilities, like seeing and understanding language.

There are four data science Masters courses within the Faculty of Natural Sciences at Stirling: Big Data; Mathematics and Data Science; Artificial Intelligence and Fintech - but I am not sure which is for me?

Fintech is the odd one out among these courses because it is geared towards a specific application in banking and finance. The other courses are designed to give you more generic data science skills. Big Data concentrates on technology and skills such as Hadoop, Python, NoSQL and machine learning.

Mathematics and Data Science is for students who have a love of maths and want an interesting and challenging subject that allows them to put their skills into practice. AI offers more advanced machine learning topics such as convolutional neural networks.

We also offer three data science Masters courses within Stirling Management School: Data Science for Business, Business Analytics and Marketing Analytics.

The Stirling data science courses were built from scratch by Stirling academics with student employability in mind. How did you create the course content?

The courses were designed with one thing in mind: to prepare and qualify students for jobs in data science. We consulted with recruitment agencies and companies who hire data scientists and Fintech professionals, such as HSBC and MBN.

Our goal was to give students the best CV that we could, which is why we do our best to find work placements for students during their summer project.