

Data Analytics MSc

Develop your skills in the various methods used to analyse big data sets and build a career in this exciting area where your knowledge and experience will be in high demand.

January 2024

Location: Aston University, Birmingham

Course type

Full-time

Course format

No placements

Duration

12 months full-time

UCAS code(s)

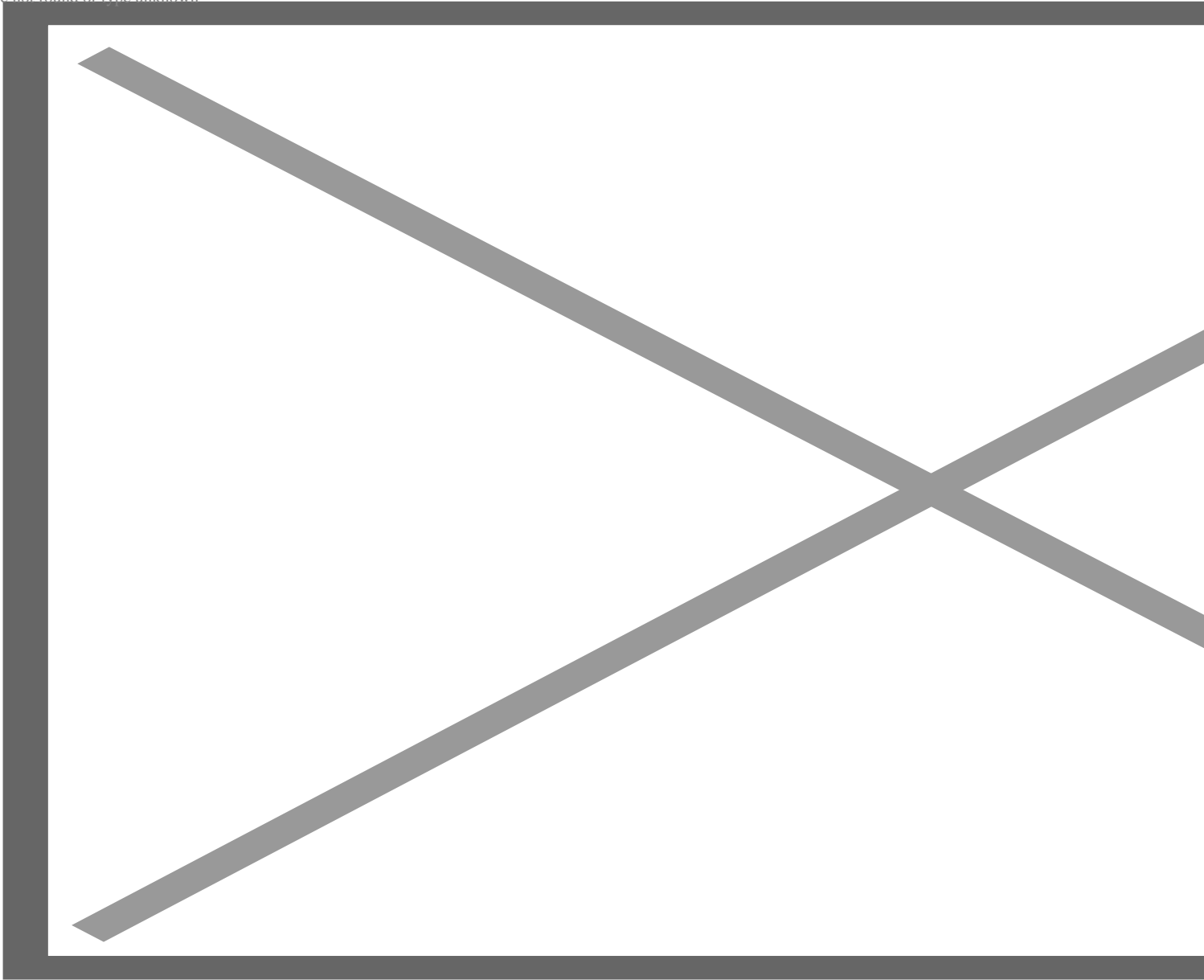
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Start date

Overview

Why explore Data Analytics at Aston University

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Starting in January?

Pay your deposit early and secure our Early Payment Discount of £2,000.

For more information visit [here](#).

Teaching staff from the Mathematics department discuss what makes Maths a fascinating subject.

Why study a postgraduate degree at Aston University?

A postgraduate degree is a great way to improve your career prospects. As well as opening doors, it builds on your experience, develops your skills, and gives you a competitive edge in a crowded job market.

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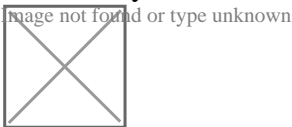
- [Opportunity to gain a masters qualification through independent study](#)
- [Full support of internationally-recognised academic staff in machine learning and data science](#)
- [Close links with industry](#)
- [A high level of expertise in an in-demand area will enhance your global employability prospects](#)

“My time at Aston University has been absolutely wonderful! I believe I have gained so much out of my degree in terms of knowledge and the applications to various fields. Moreover, I have met some amazing friends and members of staff that have constantly supported me in my learning and general well-being.”

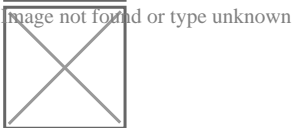
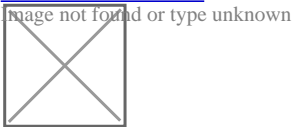
Shivani Jang
Mathematics student

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Data Analytics MSc



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Teaching Excellence Framework Gold award logo

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Shivani Jang
Mathematics student

Course outline and modules

There has never been a time where so much data has been available in conjunction with the tools to make the most of it, these tools constitute the field of data science. There has also, never been a time with so many global challenges to tackle, from the shortage of resource and the impact we have on the environment to the strive to automate and optimise a variety of systems such as transport, energy, health and communication. There are almost limitless opportunities to use these tools in the various domains and applications for making real impact on industry, society and policy making.

This course is for you if you want to use your mathematical and numerical skills to embark on a career in data science and its application. During the course you will develop the necessary analytical and computational skills alongside an informed and critical appreciation of scientific and industrial developments in data.

What you'll learn

You will gain a thorough grounding in the fundamental concepts of data analytics to understand the data lifecycle, including problem formulation, data collection and cleaning, exploratory data analysis and visualisation, statistical inference and decision making. Additionally, you will have the chance to apply your knowledge in a research project on a subject of your choice.

You will be trained in a wide range of modern data science and analytics methods in the MSc in Data Analytics programme which can be viewed below.

Option to transfer onto our Professional Practice programme

If you meet a satisfactory academic performance and have secured a suitable professional experience, you will have the option to be transferred onto our MSc Data Analytics including Professional Practice programme.

Taking the Professional Practice route allows you to extend the duration of your Masters to 22 months and gain valuable working experience to support your career aspirations. The placement commences after completion of your MSc dissertation and can be paid work, study abroad exchanges or unpaid research projects or even a mix of these options. You will return to Aston the following May for an intensive period on campus to draw all your learning together and finalise the assessments.

Although you are responsible for finding your placement, you will have access to the support of our [award-winning Careers and Placements Team](#), who have helped so many of our students to secure placement and work opportunities, including by providing CV and application preparation, and practice interviews. In addition, you will participate in a programme of activities within the School designed to develop your personal and professional skills such as industry seminars and networking activities. Opportunities for one-to-one coaching and mentoring will also support your learning journey and help you become more work-ready.

[Take a look at our specific placement information and support.](#)

Core modules

- **Statistical Machine Learning:**

You will be able to develop simple, but practical, statistical models for complex real-world data. The models can be used to automate decision making and predictions, such as detecting diseases or deciphering signals.

- **Specialist Research Skills and Techniques:**

An important objective of our MSc in Data Analytics is for students to apply the skills and knowledge they learn to real-world problems. In addition to the technical modules outlined above, you will be trained in Specialist Research Skills and Techniques to support you on your path into research through interdisciplinary seminars. You will learn how to design feasible research projects and formulate relevant research questions and hypotheses. The module will explore types of research methodologies and teach important writing and presentation skills for analysing academic literature and in drawing conclusions from research results. This leads onto a research project on a subject of your choice, where you will apply

the knowledge you have gained to produce high quality independent work.

- **Understanding Data:**

This module delivers the central stages of Data processing pipelines in the industry. You will be taught common practices for scaling of data from various sources such as: images, text, smart sensors, and audio. You will learn the main machine learning tasks and how to train supervised and unsupervised systems both using statistical features or end-to-end deep learning systems.

- **Probabilistic Modelling:**

This module will provide you with the principled probabilistic tools required for modelling and inferring data. Incorporating theoretical and practical approaches with numerical exercises, you will be trained to carry out classification, regression, forecasting, inference and optimisation tasks on data, that are essential for many application domains.

- **Data Science Programming:**

This will teach you the use of Python and R for data analysis in scientific computing. You will learn how to use Python libraries such as: (i) NumPy and Pandas, for performing complex numerical analysis tasks; (ii) Scikit Learn, to build machine learning models; (iii) Matplotlib and R for 2D data visualisations and (iv) PyTorch, to develop deep learning applications.

- **Artificial Neural Networks:**

This will teach the foundations of algorithms that can recognize hidden patterns and correlations in raw data, for clustering and classification tasks. You will study systems for continuously learning over time to improve these tasks. You will be introduced to the robust basis upon which applications can be developed.

- **Network Science:**

This will provide you with the means to recognise and solve practical problems related to networks in nature and society. You will be introduced to advanced techniques for modelling real-world problems in the forefront research of the field.

60 credit module:

- **Research Project:**

As part of your Research Project, you will work under the supervision of an academic, you will be able to carry out high-level research work on a suitable problem developing and critically assessing a usable solution. This will include a thorough literature survey on the background of the research project subject domain, interact with other researchers, and write and defend a dissertation on it.

Optional modules

Choose one of the following:

- **Algorithmic and Computational Mathematics:**

This focuses on the in-depth study of key general algorithms, with their numerical implementation, which are the heart of data processing and modelling. This includes approximation techniques, interpolation, sampling, etc. that are practiced with hands-on coding.

- **Fundamentals of Data Analytics**

Hello - what would you like to ask us?

Group of students with Hello text

Hello! We're a team of current Aston University students, we're from 10 different countries and we study a range of different postgraduate subjects.

[Click here to ask us anything about studying at Aston University.](#)

Speak to our Admissions Team

For guidance on completing your postgraduate application, read our [how-to-apply guide](#).

Entry requirements

Entry requirements

We expect applications from graduates of Mathematics, Statistics, Computer Science, Engineering, Physics or Data Science or related disciplines, with a qualification equivalent to a UK BSc with Honours at 2:2 or higher. Evidence of knowledge of Mathematics and Programming should also be provided when the degree is not in Mathematics (i.e. transcript of degree programme or work experience). When a transcript is provided, the Mathematics and Programming grades should be equivalent to UK 60% or higher. Candidates may be interviewed prior to the offer decision.

As well as:

Two professional references – at least one must be from an academic referee
A completed application form.

International students

- An official academic transcript, with an official English translation, of your university grades to date
- Applicants whose first language is not English will be required to provide evidence of an English language qualification. [Find out more](#) about our English language requirements
- Pre-sessional English language programmes are available for good applicants whose English qualification falls just short of these requirements.
- For more information about qualifications, view our [Aston in your country](#) webpage. [Information on visas](#) for international students
- For International Students intending to do a foundation year. [Click here to find out more](#).

Extensive work experience

We recognise the value of extensive professional experience. If you do not have the academic qualifications, but have extensive and relevant professional experience and a proven ability to succeed, we would welcome your application.

The information contained on this website details the typical entry requirements for this course for the most commonly offered qualifications. Applicants with alternative qualifications may wish to enquire with the relevant admissions teams prior to application whether or not their qualifications are deemed acceptable. For less commonly encountered qualifications this will be judged on a case-by-case basis in consultation with the academic admissions tutor.

Learning, teaching and assessment

Our Data Analytics masters course combines tutorial-based teaching with self-directed study, so you'll be equipped with the relevant learning materials and then given regular tutorials where you have the opportunity to discuss and demonstrate what you've learned alongside potential applications.

The learning hours include one hour of face-to-face tutorial time per week, per module, along with online activities, reading, independent study, and opportunities to reflect on assignment feedback.

The taught modules will be assessed via coursework, and the project via a combination of dissertation and viva examination.

Fees and scholarships

UK students (2023/24)

Annual tuition fees: £11,000

EU/International students (2023/24)

Annual tuition fees: £20,700

Tuition fees are reviewed annually and may increase in subsequent years in line with inflation linked to the Retail Price Index (RPI) to take account of the University's increased costs of delivering the Programme. When undertaking a placement year a placement year fee applies.

UK postgraduate loans available

If you're starting a masters course on or after **1 August 2022**, you can apply for a postgraduate loan of up to **£11,570** to help with course fees and living costs. [Find out more.](#)

Scholarships

At Aston University we are committed to supporting the most talented and hardworking students to achieve their potential by providing a range of scholarships to help lower tuition and living costs. [Find out more about our UK student scholarships here.](#) [Find out more about our international student scholarships here.](#)

20 per cent postgraduate alumni scholarship

Cost shouldn't limit your career aspirations, which is why we are delighted to offer all Aston University graduates (including exchange students) a 20% loyalty scholarship in standard taught MA, MSc and Full-time MBA course fees. As an Aston University graduate, you will automatically qualify. [For more information visit our webpage.](#)

Career prospects

The global data science platform market size is anticipated to reach over \$178 billion by 2025. Data science has applications in all areas of industry, science, government and services, from retailing to streaming.

Our graduates leave with the in-depth knowledge and skills they need to develop careers across a variety of fields. Their data science expertise makes them employable in industry, in commercial and finance sectors as well as in applied and scientific research. Students who graduated from our programmes have secured positions in a broad range of companies, from start-ups to well-established corporations.

International students

Aston University is a diverse, close community and welcomes international students on many of our postgraduate programmes. Students from over 120 different countries chose to study with us every year and Aston is not only a great place to study, based in the centre of Birmingham it's also a great place to live.

Post-study work visa

Aston University welcomed the creation of a new immigration route which will enable international students to remain in the UK for two years after they have completed their studies to find work. The new post-study work visa will apply to international students starting undergraduate and postgraduate courses from 2020. [Click here for more information on post-work visas](#)

Frequently Asked Questions

Why study Data Analytics at Aston?

Aston has a tradition of expertise in data science, starting in 1993, and has been providing data science courses of various types to both industry and academics since 1996. Many of our graduates has secured high-profile employment in academia and industry. We have kept updating the provision over the years to train our students in state-of-the-art techniques, making the course relevant and exciting. The course is delivered by a team of experienced and active researchers in the fields of machine learning, statistical

physics and computer science; yet, we are friendly and approachable, aiming to help students make the most of their course.

What will I be doing on the Data Analytics course at Aston?

The main skill you will acquire is looking at the world through the eyes of a data scientist, with a deeper understanding of the mathematical and statistical processes that govern it. You will be equipped with the knowledge to identify the analytical tools most suitable for the job at hand and be able to apply them computationally. For that you will be trained in understanding data, machine learning (AI) probabilistic techniques, network representation of data and in using common computing languages (Python, C++, Matlab).

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[New strategy outlines role of biomass in UK's transition to net zero, with sustainability as major theme.](#)

[NEWS - 19/07/2023](#)

[Aston University appoints Digital Futures Institute leadership team](#)

[Professor Abdul Hamid Sadka, Professor Maia Angelova and Professor Manolya Kavakli will be joining Aston University from September 2023 and the Institute will be formally launched later in the year.](#)

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Student Life at Aston

Accommodation

We provide award-winning accommodation on our small, friendly campus in partnership with Unite Students

Students' Union

Aston SU represents and supports around 14,000 students, providing a number of commercial and non-commercial services.

Birmingham life

Aston University is in a great, central location. Ideally positioned in the centre of Birmingham - one of the youngest cities in Europe - our campus is only a 10 minute walk to the city centre.

Clubs and societies

Joining a club or society is one of the best ways to get the most out of your time here at Aston. With over 130 student-led groups we have something for everyone.

Sports

Here's Sports at Aston. Discover what's happening on the Aston University campus at the Sir Doug Ellis Woodcock Sports Centre.

Student support at the Hub

The Hub is a central location on the Ground Floor of the Main Building where most of the student support services are located.

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