Northumbria University NEWCASTLE | Newcastle London Amsterdam

# MSc Big Data and Data Science Technology with Advanced Practice

## London Campus

**Level of study:** Postgraduate

**Mode of study:** Full-time

**Duration:** 16-24 months

**Response to Covid-19:** Our focus is on providing a safe and welcoming learning environment and ensuring continued access to learning.

As a result of the coronavirus (Covid-19) pandemic and resulting social distancing requirements, we are intending to teach this course using a mix of on-campus and online learning activities. We continue to be guided by the Government to ensure our campus is Covid-secure. More information about our response to Covid-19 and FAQs are available here.

All information is accurate at the time of sharing. Courses starting in 2021 are offered as a mix of face to face and online learning. We continue to monitor government and local authority guidance in relation to Covid-19 and we are ready and able to flex accordingly to ensure the health and safety of our students and staff. Contact time is subject to increase or decrease in line with additional restrictions imposed by the government or the University in the interest of maintaining the health and safety and wellbeing of students, staff, and visitors, potentially to a full online offer, should further restrictions be deemed necessary in future. Our online activity will be delivered through Blackboard Ultra, enabling collaboration, connection and engagement with materials and people.

### Overview

The demand for data scientists is ever rising. A report by Harvard Business Review suggests that the shortage of data scientists has become a serious constraint in certain sectors, leading the authors to claim Data Scientist as the Sexiest Job of the 21st Century.

Data Scientists carry out applied research to create innovative data-driven solutions to business problems. Usually, they work with large, complex, varied, and unstructured data sets that are not suitable for using traditional data analysis approaches and techniques. This programme is specifically designed to enable you to develop this in-depth technical

knowledge that will allow you to discover new data-driven solutions.

## Key facts

- Develop in-demand skills to work in a range of roles in the IT industry
- Enhance your knowledge in the application of programming language, big data and machine learning on cloud
- The Advanced Practice includes an Internship or Group Consultancy Project, enhancing your employability with all-important work experience
- This programme has been designed to meet the accreditation criteria of BCS, the Chartered Institute for IT for the purposes of meeting the academic requirement for registration as a Chartered IT Professional
- Upon completion of your programme, you will be eligible for the QA Professional Pathways programmes which will enable you to further develop your skills with one of the UK s largest providers of IT and project management training

## Course information

**Level of study:** Postgraduate
**Fee (UK/Home):** £11,400
**Fee (International):** £19,000
**Entry requirements:** 2:2 honours degree, or equivalent in any subject IELTS 6.5 with no single element below 5.5, or equivalent .
**English language requirements:** IELTS 6.5, with no single element below 5.5, or equivalent
**Mode of study:** Full-time
**Duration:** 16-24 months
**Assessment methods:** Coursework
**Scholarships or bursaries:** available
**Student finance:** available
**Payment plan:** available
**Starts:** Jan, May, Sep,

# About this course:

## What will I study?

To accelerate your learning, you will be exposed to theories, methods, tools, and technologies (including SQL, MySQL, Python, R language or similar) relating to the design, development and testing of data science applications for business intelligence.

You will train and deploy distributed machine learning models using a cloud-based platform such as Google Cloud, Microsoft Azure or AWS or similar and machine learning technology using TensorFlow. You will also be exposed to the fundamental concepts, principles, technologies, and techniques of big data analytics.

You will be able to apply this knowledge and skill in your context, and critically analyse the implementation and recommend future improvements. Recognising that information governance and cyber security are critical to the adoption and use of computing systems in businesses and organisations, you will also cover fundamental concepts, principles, techniques and tools of information governance and cyber security.

## How will I be taught and assessed?

- Teaching is delivered through lectures, workshops and tutorials totalling between **10-13 hours per week**
- You re expected to engage in independent study, around **30-32 hours per week**
- **Assessment** includes coursework, critical report writing, practical exercises, individual, group and research project work.
- Taught by **experienced lecturers and academics** who use their industry experience to demonstrate how theories translate into real-life situations.
- **Technology-enhanced** learning is embedded throughout the course to guide your preparation for seminars and independent research
- Benefit from **weekly academic support sessions** designed to build your ability and confidence as an academic learner
- You will be assigned a **guidance tutor** at induction who you will meet with regularly during your studies

## Advanced Practice stage

The Advanced Practice version of this course offers you a valuable opportunity to secure a work placement, complete a group consultancy based on a real organisational issue or work with a research team on a research project. Successful completion of this Advanced Practice stage will provide you with experience of the workplace environment or live computing issues and an excellent way to put your learning into practice.

This stage of the programme will take place between your second and final semester and is a semester-long (15 weeks) in duration. Internships as part of the Advanced Practice stage may be paid or unpaid. The alternative research module allows you to work with an academic or applied research team within the university on a range of research topics. Whether you choose the Internship, Group Consultancy Project or the Research Project, you will successfully develop your business or research skills and further enhance your employability.

- **September start dates:** your programme will last for up to 21 months. You will have a summer break after Semester 2, and commence your Advanced Practice stage in September.
- **January start dates:** your programme will run for 24 months. You will commence the Advanced Practice stage of the programme in January following your taught stage and summer break. Please note that there are two summer breaks included in this programme for those starting in January.
- **May start dates:** your programme will run for a total of 16-18 months. Please note that there is no summer break included in this programme for those starting in May. Your Advanced Practice stage will commence in January.

The Advanced Practice programmes are structured as below:

| | Sept-Jan | Jan-May | May-Sept | Sept-Jan | Jan-May | May-Sept | Sept-Jan |
|---|---|---|---|---|---|---|---|
| September starts | Semester 1 | Semester 2 | Summer break | Advanced Practice stage | Final semester | | |
| January starts | | Semester 1 | Summer break | Semester 2 | Advanced Practice stage | Summer break | Final semester |
| May starts | | | Semester 1 | Semester 2 | Advanced Practice stage | Final semester | |

## Careers and further study

This Master s programme has been designed to ensure that graduates will be equipped to work in a variety of careers in the IT industry or to progress to academic or research-orientated careers. Indeed, the qualification is designed to accelerate your skills and competence in a range of job roles, including roles in leadership and management such as:

- Machine Learning Engineer
- Data Engineer
- Business Analyst
- Data and Analytics Manager
- Business Intelligence Analyst
- AI Cloud Architect
- Data Architect

Furthermore, this programme will prepare you to meet the educational requirements of the BCS, The Chartered Institute for IT for the purposes of meeting the further learning academic requirement for registration as a Chartered IT Professional.

Upon successfully completing your course, you may undertake further professional development and training through Professional Pathways programmes. These are offered to our graduates for free, from our partner, QA. Find out more information on Professional Pathways and your eligibility.

Enquire now

Related reading

**Advanced Practice:**

- Master Your Future: MSc with Advanced Practice
- What is a 'Masters with Advanced Practice ?
- Infographic: The Stages of a Masters with Advanced Practice
- Studying a Masters with Advanced Practice

# Entry requirements

## Academic requirements

- Minimum 2:2 honours degree, or equivalent in any subject

**If you don t meet the academic requirements**

Applicants who are not graduates and do not hold professional qualifications of equivalent standing can also be considered for entry if they show evidence of strong motivation and capability for academic study and personal development (e.g. evidence of attendance at short courses) and/or suitable experience of working in areas which involve a significant amount of Information Technology.

Please visit our entry requirements page for country-specific qualifications.

Alternatively, you may also be eligible for our Pre-Masters courses. These are pathway programmes designed specifically for students who are looking to progress on to a Masters degree but who don t currently meet the entry requirements.

## English language requirements

- Students require an IELTS 6.5, with no single element below 5.5, or equivalent.

If you have IELTS 5.5 – 6.0, you may be eligible to join our Pre-Sessional English before starting this programme.

Enquire now

# Modules

All modules on this course are core and 20 credits unless otherwise stated.

### Information Governance and Cyber Security

In this module, you will learn about the information governance and cyber security principles that underpin the management of an organisation s information assets. You will critically analyse the key concepts, theories, standards and frameworks of information governance and security, including risk management.

It will enable you to evaluate an organisation s current approach to information governance and cyber security. You will have the expertise to advise on the design and implementation of an appropriate strategy for managing an organisation s information (ensuring all assets meet legal, regulatory, organisational and/or societal needs for information governance and cybersecurity).

### Leadership in a Digital Age

In this module, you will develop new knowledge and skills in leadership in a digital context. You will conduct a self-analysis of your own leadership and team management competencies and identify strengthens and areas of improvements.

Leadership and team management capabilities are essential for your career development. They enable you to become competent at the visioning, development and deployment of technological strategies and responses to challenges and opportunities in complex operating environments.

### Applied Data Science

In this module, you will develop a critical understanding of applied data science methods, techniques and tools. You will learn how to manage, manipulate and model data in its various forms and harness its potential for business intelligence.

We will look at scientific methods and the fundamental statistical approaches used for predictive modelling applied to real-world problem scenarios, using state of the art tools and technologies including the use of programming languages such as SQL, Python or similar, and tools such as Power BI, Tableau or similar.

In addition, we will investigate the visualisation of data and consider how the findings from data science projects can be communicated to various target audiences.

### Academic Language Skills for Computer and Information Sciences (0 credits)

This module is designed to support your transition in the use and practice of technical language and subject-specific skills around assessments and teaching provision in your chosen subject area.

The overall aim of this module is to develop your abilities to read and study effectively for academic purposes.

You will gain practical skills in analysing source material and using it in seminars and academic writing, whilst advancing your language and communications skills to a higher level.

### Research Methods for Professional Practice

This module is designed to ensure you have the skills and knowledge to complete a postgraduate research project, relevant to Big Data and Data Science Technology and your career or future aspirations. As such, you will work closely with tutors and our careers and professional development specialists to consider the future opportunities post completion of your degree.  You will develop a career plan and reflect on your learning considering how your learning from this module and the programme can accelerate the achievement of this plan.

To further prepare you for your final research project, this module will familiarise you with the nature of research and project management and the processes involved. Research approaches and methods will be covered, including literature evaluation and review.

In this module, you will additionally explore and use several tools and techniques that are in use in the field of project management to ensure that projects are completed successfully.

## Big Data Analytics

This module provides you with in-depth coverage of fundamental concepts and principles of big data and the analytical techniques and technologies used for big data analytics.

Big data analytics relates to the use of advanced analytical techniques applied to vast volumes of rapidly changing diverse data sets to gain knowledge, insights and uncover hidden patterns from data. Such insights and knowledge provide a competitive advantage to businesses and organisations and also help them inform their decisions to transform their businesses.

You will develop the ability to apply statistical and big data science techniques to large scale data sets by using a unified analytics framework such as Apache Spark or Hadoop, or similar.

You will learn how to analyse large organisational data assets (including text and web data) and create data-driven solutions to real-world problem scenarios to advance the knowledge base used for business intelligence.

## Machine Learning on Cloud

The module aims to provide you with a critical review of the theory and practice of machine learning on the cloud platform. You will critically analyse the capabilities of machine learning and apply its methods and techniques to discover patterns for trends analysis.

The module will introduce you to neural networks and their implementation. You will train and deploy distributed machine learning models using cloud-based platforms such as Google Cloud or AWS or Microsoft Azure, or similar. You will develop skills on how to apply supervised, unsupervised and reinforcement learning using cloud platforms and tools such as TensorFlow or similar.

## Computing and Digital Technologies Project (60 credits)

This module aims to enable you to undertake a substantial academic research project at the Masters level and present the results from this work in both written and oral forms. Your project itself will be a piece of independent and original research centred at the forefront of your programme discipline within the wider sphere of the computer science and digital technologies field.

You will experience the full life cycle of a research project- from initial conception and development of a research proposal, through a critical review of the literature, planning, design, implementation and analysis of your main research project, to final evaluation, reflection and dissemination.

You will be expected to consider and address the professional, ethical, legal and social issues related to this academic research project. You will also be expected to apply your expertise, project management and practical skills within your particular domain of computer science and digital technologies and demonstrate critical and innovative thinking and problem-solving within a research environment.

Your research proposal will normally have been produced as part of an earlier module on research and project planning but should be reviewed again at the start of the project phase to ensure it is still valid and appropriate.

## Advanced Practice stage

You will choose one of the following modules:

### Engineering and Environment Advanced Practice London Campus – Consultancy Project (60 credits)

This module aims to provide you with an experiential learning opportunity where you will work on a group consultancy project that utilises skills and knowledge acquired during the taught part of your study programme. You will work as a team of 3-5 students on a project for a real-world organisation and be supported by an experienced academic supervisor throughout your project.

You will learn to work independently and develop resilience and flexibility as you adapt to a different learning environment, and gain a new perspective through comparison with your taught studies. The module will help you develop your abilities as a problem solver with valued investigative, theoretical and practical skills to implement a work-based consultancy project. Through this consultancy project, you will help develop hands-on experience of working on a real-life project that experience is directly transferrable to be utilised to the world of work after your graduation.

### Engineering and Environment Advanced Practice London Campus – Research Project (60 credits)

The Advanced Practice Research Project module is designed to deepen your knowledge and enhance your research skills in your specialist field. The aim of this module is to provide you with an opportunity to work on a research study that utilises skills and knowledge acquired during the taught part of your study programme. You will be supported by an experienced academic supervisor who would provide guidance at different stages of this research project.

A high level of participation will be required from you to undertake this research project. Independent learning will help you focus on identifying and pursuing areas of interest in relation to the research study or by providing deeper/broader knowledge and understanding of the subject through a range of learning activities that might include extended reading, reflection, research etc and application of these to your research-based project. You will learn to work independently and develop resilience and flexibility as you adapt to a different learning environment, and gain a new perspective through comparison with your taught studies. The module will help you develop your abilities as a researcher with valued investigative, data analytical, theoretical and practical skills to implement a research project.

### Engineering and Environment Advanced Practice London Campus Internship (60 credits)

This Advanced Practice module is designed to deepen your knowledge and enhance employability in your specialist field. This module aims to provide you with an experiential learning opportunity in a workplace setting that utilises skills and knowledge acquired during the taught part of your study programme. You will develop resilience and flexibility as you adapt to a different learning environment, and gain a new perspective through comparison with your taught studies.

You will be allocated an academic supervisor who would provide you with support throughout your internship.

Assessment on the module is designed to focus on the awareness of the impact of the time spent in an external learning environment, on your knowledge and understanding of the discipline. You will be encouraged to critically engage with outside practices, and to reflect on your educational development in the context of the challenges posed by an unfamiliar social, cultural and economic environment.

Enquire now

## Fees and finance

### Tuition fees 2021/22

- **UK/Home students:** £11,400
- **International students:** £19,000

### Tuition fees 2022/23

- **UK/Home:** £12,075
- **International students:** £19,500

Please note that your tuition fees do not include the cost of course books that you may choose to purchase, stationery, printing and photocopying, accommodation, living expenses, travel or any other extracurricular activities. As a Northumbria University London Campus student, you will have full access to our online digital library with over 400,000 e-books and 50,000 electronic journals.

#### What's included in your tuition fees?

Your tuition fees cover far more than your time in class with our expert academics, it covers the cost of providing you with excellent services and student experience.

- Contact time in class – typically in lectures, seminars and tutorials
- Access to facilities, including computers, on-campus Wi-Fi, printers, vending machines, quiet study spaces
- The support of our Careers & Employment Service helps you to become more employable, secure placements and run workshops
- Academic support – our ACE Team run multiple sessions on academic writing, presenting, exam techniques throughout the semester, as well as 1-2-1 appointments and drop-in sessions
- Student support services such as our Ask4Help Service. Find out more about the services available to you on our Student Support page
- Access to online resources, including 24/ 7 Library with over 400,000 e-books and 50,000 electronic journals.

### Scholarships and bursaries for international students

If you are an international student and choose to study the full-time programme, you will be eligible for either our

programme bursary or a country bursary, whichever is greater. High performing students may be eligible for an academic scholarship in addition.

Depending on the country you are from, you may be eligible for one of our country bursaries and/scholarships to help finance your studies.

All of our scholarships and bursaries are automatically applied when we process your application and our team will be able to confirm your eligibility.

Scholarships and bursaries

### Payment plans for self-funded students

If you need to spread the cost of your tuition, you may be eligible for our payment plan.

Payment plans

### Government Loan for Masters study

If you are a UK/Home student, you may be eligible for a postgraduate loan of up to £10,000+ from the UK Government. Click here to find out more about the loan and whether you are eligible to receive it.

Postgraduate Loan

## How to apply or find out more

### How to find out more

Enquire now to find out more information about the course, studying with us, the application process, and to ask any other questions you may have.

Enquire now

### How to apply

Once you  re ready to apply, you can apply online to study the MSc Big Data and Data Science Technology. This method allows you to upload your supporting documents at the time of application and automatically receive your student application number.

Apply online

We strongly recommend that you submit your application as early as possible to allow you to complete all of the preparations needed to study your programme. After receiving an offer it can take time to arrange your finances and apply for your visa (if required) and it is important that you arrive in good time to enrol onto your course. Please refer to the Dates and Fees page.

If you are unable to apply online, then you can download a PDF application form and email it to london.admissions@northumbria.ac.uk.

International students application form  UK/Home students application form

**Supporting documents**

For us to assess your application in a timely manner, it is important that you provide us with the following documents:

- Fully completed application form
- A personal email address must be included on the application form
- Transcripts and/or certificates (including a certified translation if not in English)
- Passport – a copy of personal details page
- Proof of financial sponsorship if applicable
- Reference
- Confirmation of immigration history including copies of previous and current visas if applicable

You can check more information on how to apply here, including guidelines for the application forms.