WALBROOK
Institute London

MSc Data Science

Programme Specification

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Contents

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General Information

UCAS Code	Award	Programme Title	Expected Duration	Study Mode
N/A	MSc	Data Science	1 year 1.5 years 2 years	Full-time Part-time 1 Part-time 2
		Programme Code UK-LIBF-MADSC		
	Exit Awards	• Postgraduate Diploma • Postgraduate Certificate		

Credit Count	**180 FHEQ credits**
Awarding Institution	Walbrook Institute London
Teaching Institution	Walbrook Institute London
Delivery Modes	• Face-to-face • Blended • Online – Synchronous • Online – Asynchronous

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Record of modifications			

Programme Overview

Programme Summary

Digitalisation has led to significant advances and changes to economies and societies around the globe. With Data Science being one of the core disciplines of digitalisation, there is an ever-growing demand for specialists in this area who can effectively manage, oversee, and advance data-driven processes and support businesses in optimising operations, increasing efficiency, and innovating on the basis of digitalisation.

The MSc Data Science fosters innovation by preparing you for a career in Data Science and data-science related fields. The programme is designed to provide you with advanced knowledge of mathematics, statistics, and programming, combined with data science fundamentals. A selection of elective modules provides the possibility to gain insights into industry-relevant fields and practical application areas of data science.

Programme Aims

The MSc Data Science aims to

- provide you with advanced knowledge and a systematic understanding of the key principles and leading concepts of data science and related fields, including mathematics, machine learning and statistics.

- equip you with a comprehensive and critical understanding of the complex theoretical and leading practical concepts in data science such as machine learning and deep learning theory, software, and model engineering.

- develop your ability to critically evaluate and appropriately apply the learned theories and skills to a wide variety of problems and scenarios, complex new contexts as well as practical areas of application.

- enhance your critical thinking and research skills, enabling you to critically analyse current data science research, concepts, and practices and to autonomously propose novel approaches and original hypotheses to solve problems.

- give you a critical insight and understanding of novel developments and current issues in data science and enhance your ability to broaden your knowledge of new developments in industry-relevant fields through a process of independent and self-directed learning and effective communication with a wide variety of stakeholders and audiences.

Employability & Graduate Outcomes

Graduates of this programme are likely to pursue careers in a number of areas in the data science sector including data engineering, data analytics and consulting. This programme of study should support graduates in developing the following employability skills:

- digital, technical, and statistical literacy

- high level of numeracy

- communication skills

- creative thinking and problem-solving skills

- analysis and critical thinking skills

- adaptability and continuous learning

Intended Learning Outcomes of the Programme

This programme has been developed in accordance with the QAA Subject Benchmark Statement for Computing (C) (2022).

Please note: The programme's intended learning outcomes below are described at Masters level (Level 7).

On successful completion of this programme, you will be expected to:

L01 Demonstrate a systematic understanding of the key principles, leading concepts, and theories of data science, in particular mathematics, statistics, and machine learning. (C 4.14)

L02 Demonstrate a broad comprehension of complex theoretical and practical concepts in data science, including deep learning theory, software and model engineering. (C 4.14)

L03 Demonstrate an appropriate application of project management and creative problem-solving skills in data science projects, while effectively communicating results and complex technical information to groups of different levels of expertise through the utilization of various media and formats. (C 4.14)

L04 Analyse and interpret complex data using advanced statistical methods and machine learning techniques, including deep learning, neural networks, and Bayesian statistics. (C 4.14)

L05 Evaluate complex data sets by synthesising appropriate models and algorithms to extract meaningful insights and conclusions. (C 4.14)

L06 Critically evaluate the suitability of specific data analysis tasks across various contexts and domains, while demonstrating the aptitude to select appropriate use cases and methodological approaches for their effective implementation. (C 4.14)

L07 Critically evaluate data and models, including their validity, completeness, reliability, sources of error and uncertainty, while applying appropriate quality assurance techniques. (C 4.14)

L08 Through independent selection of an optional module, demonstrate critical understanding of broader theories and concepts in the field of data science. (C 4.14)

L09 Formulate appropriate research questions and hypotheses and apply advanced critical thinking and problem-solving skills to complex data science challenges, exercising initiative and judgement to develop innovative solutions. (C 4.14)

L010 Systematically advance personal and professional skills through a process of self-directed and independent learning, demonstrating effective self-management skills, including time management and self-reflection in the process. (C 4.14)

The Structure of the Programme

The MSc Data Science programme is offered as a 1-year full-time programme or in part-time mode over a 1.5 or 2-year period.

The programme is divided into modules which include both compulsory and elective modules weighing 15 credits each and a thesis weighing 45 credits. All modules in the programme are assigned to Level 7.

To achieve the full Master's award, students need to complete modules with a combined weight of 180 credits, including the final thesis.

Table 1: Structure of the Programme

Module Code	Module Name	Credit	Compulsory / Elective
LIBFWAWADLMDSPWP	Programming with Python	15	C
LIBFEXDLMDSAM	Advanced Mathematics	15	C
LIBFAWDLMDSAS	Advanced Statistics	15	C
LIBFEXDLMDSML	Machine Learning	15	C
LIBFWAWADLMARM-01	Advanced Research Methods	15	C
LIBFWAWADLMDSDL	Deep Learning	15	C
LIBFWAWADLMDSUCE	Use Case and Evaluation	15	C
LIBFWACSDLMDSME	Case Study: Model Engineering	15	C
Elective		15	E
LIBFMTMMTHE	Master Thesis	45	C

Table 2: List of Electives

Module Code	Module Name	Credit	Subject Area*
LIBFOARPDLMDSBDT	Big Data Technologies	15	n/a
LIBFOARPDLMDSSEDIS	Software Engineering for Data Intensive Sciences	15	n/a
LIBFAWDLMDSINDA	Industrial Automation	15	n/a
LIBFEXDLMDSEAAD1	Architectures of Self-Driving Vehicles	15	n/a
LIBFIRPFSINTER	Internship	15	n/a

Teaching, Learning & Assessment

Information about teaching, learning and assessment can be found in the Teaching, Learning and Assessment Strategy.

Our programmes are designed to:

- integrate theory with practice,

- develop your ability to critique and challenge models and theoretical frameworks,

- stimulate debate, discussion, and research,

- foster a variety of academic skills,

- be accessible and inclusive,

- develop global citizens.

You are expected to undertake a considerable amount of independent study, including reading, industry-related research, and personal reflection.

Teaching Formats

The programme may be offered in various teaching formats, for example online or via blended learning.

You will have access to both asynchronous and synchronous teaching formats.

Via the Course Feed in the virtual learning environment, myCampus, you will be able to contact the module tutor in a flexible and accessible way.

This is also where Intensive Live Sessions are conducted synchronously with video-based elements. They serve to answer students' individual questions as well as to allow for group discussions.

Additionally, Learning Sprints[1] will offer a seven-week intense learning experience in which the lecturers guide students through the learning material in a very structured manner, with the goal of successfully preparing them to take the final assessment at

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[1] Offered only when the minimum number of participants is reached.

the end. During this time, frequent synchronous online meetings are held, offering keynote speeches and interactive tasks.

Both the Intensive Live Sessions and Learning Sprints are recorded to further assist asynchronous learning.

In the blended format, teaching and learning combines online and in-person learning in a *flipped* classroom concept. Traditional classroom activities like lectures are conducted online via the learning platform, while in-class time is used for interactive work. On-campus elements like study groups and library study time complement this approach.

Learning Resources

You will have access to a wide range of resources, which may include the following:

- myCampus: This Moodle-based central information and digital learning platform is organized based on programmes and modules. On the respective module pages in myCampus, you can access all study materials (e.g., course books (i.e., text books), reading lists, practice exams, and video galleries) as well as the links to all related resources and databases (e.g., MS Teams, links to the library for further reading, contact details of lecturers, links to the booking tool for online exams, and the Turnitin submissions page). In the blended model you have access to the same learning platform, with slight adaptations made to accommodate, for example, differences in study sequence.

- Learnhub App: You can access your learning materials in a digital app and have all your notes and highlights synchronised. The app supports different learning formats, such as reading and annotating course books, using different colour codes, assessing knowledge with interactive self-tests, or watching the latest videos of the current module.

- Our comprehensive online library is aligned with the study content and kept up to date. Compulsory and further reading is mentioned in the course and module descriptions available for the students and aims to provide them with unlimited access.

Assessment & Feedback

Regulations relating to progression and assessment, including information on late submissions, are as set out in The Walbrook Institute London's General and Academic Regulations for Students.

Assessment strategies follow The Walbrook Institute London's Higher Education Accessible and Inclusive Learning Policy.

Assessment consists of both formative and summative approaches, and feedback and feedforward are provided as outlined in the Walbrook Institute London's Higher Education Assessing Learning & Feedback Policy. The different types of assessment used by the Walbrook Institute London are described in the Higher Education Types of Summative Assessment Guidance.

Module assessment methods are included in Module Handbooks which are made available in myCampus.

Credit and Award

Credit Framework

The MSc Data Science is made up of 180 FHEQ credits. One credit approximates to 10 student effort hours; therefore, the total course requires an average of 1,800 hours effort. Typically, one ECTS credit is the equivalent to two UK credits, although this may vary depending on the individual European state's requirements.

Award

On successful completion of the full programme, you will be awarded the MSc Data Science.

Regulations

The Walbrook Institute London's General and Academic Regulations for Students detail

- regulations governing the award of credit,

- how grades for awards are granted,

- time limits for completion of programmes of study

- capping of marks and regulations relating to the resitting of assessment components

- academic misconduct e.g., malpractice, and

- accreditation of prior learning (APL).

Exit Awards

In line with The Walbrook Institute London's General and Academic Regulations for Students, the following applies:

Postgraduate Certificate (PgCert)	minimum of 60 credits, of which at least 40 credits must be at Level 7
Postgraduate Diploma (PgDip)	minimum of 120 credits, of which at least 90 credits must be at Level 7

Note: The Walbrook Institute London does not award interim qualifications. For example, a student registered for the master's degree will not automatically be awarded a Postgraduate Diploma or Certificate on completion of the required number of credits.

Professional Recognition

Credits gained via accreditation of prior learning (APL) into our awards may mean that students will not get certain exemptions from other institutions' higher education or professional awards that may recognise our programmes.

Criteria for Admission

Normally, successful applicants will possess a 2.2 Honours degree (or equivalent) from a recognised institution.

Applicants not possessing this requirement may be considered if they can demonstrate their ability to achieve at this level and contribute to the debates, discussions, and work of the learning set. In this case, applicants may be interviewed and / or required to submit a piece of written work in addition to their application to enable an assessment to be made of their suitability for the programme.

Applicants for whom English is not their first language would be expected to demonstrate their competence through achieving an IELTS score of 6.5 or above with no element below 6.0 (or equivalent). An online English test is offered (SPEEX) if IELTS not available. Alternatively, evidence you have previously studied in English at an appropriate level and at a recognised institution, may be accepted.

Benchmarks

External

QAA UK Quality Code, including:

- o Subject Benchmark Statement for Computing (2022)

- o Level 7 descriptors in the Framework for Higher Education Qualifications in England, Wales and Northern Ireland

- o Master's degree characteristics

- o The Frameworks for Higher Education Qualifications of UK Degree Awarding Bodies (FHEQ)

Internal

- The Walbrook Institute London Code of Practice

- The Walbrook Institute London General and Academic Regulations for Students

In addition, research with the relevant sector has been undertaken to ensure that the learning outcomes of the programme address identified skills and knowledge gaps.

Links

Teaching, Learning and Assessment Strategy

The Walbrook Institute London's General and Academic Regulations for Students

The Walbrook Institute London's Code of Practice for Quality Assurance, Chapter 3: Accreditation of Prior Learning (APL)

Accessible and Inclusive Learning Policy

Types of Summative Assessment

Higher Education Assessing Learning & Feedback Policy

Subject Benchmark Statement for Computing

Framework for Higher Education Qualifications in England, Wales and Northern Ireland

Higher Education Credit Framework for England

Characteristics Statement: Master's Degree

Curriculum Map of Modules Against Intended Learning Outcomes of the Programme

Module Code	Module Name	Compulsory/ Elective	Intended Learning Outcomes of the Programme									
			LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO 10
LIBFWAWADLMDSPWP	Programming with Python	C	X				X					
LIBFEXDLMDSAM	Advanced Mathematics	C	X				X					
LIBFWAWADLMARM-01	Advanced Research Methods	C	X	X		X	X	X	X		X	X
LIBFAWDLMDSAS	Advanced Statistics	C	X			X	X	X	X			
LIBFEXDLMDSML	Machine Learning	C	X	X		X	X	X			X	
LIBFWAWADLMDSDL	Deep Learning	C	X	X		X	X	X			X	
LIBFWAWADLMDSUCE	Use Case and Evaluation	C			X		X	X	X		X	
LIBFWACSDLMDSME	Case Study: Model Engineering	C		X	X	X	X	X	X		X	
LIBFOARPDLMDSBDT	Big Data Technologies	E		X	X			X	X	X		
LIBFOARPDLMDSSEDIS	Software Engineering for Data Intensive Sciences	E		X	X			X		X		X
LIBFAWDLMDSINDA	Industrial Automation	E			X			X		X		
LIBFEXDLMDSEAAD1	Architectures of Self-Driving Vehicles	E			X			X		X		

Code	Module	Type											
LIBFIRPFSINTER	Internship[2]	E			X	X	X	X	X	X	X	X	
LIBFMTMMTHE	Master Thesis	C			X	X	X	X	X		X	X	
		This table shows the distribution of the programme's intended learning outcomes (as specified in the programme specification) across the programme modules.											

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[2] Check eligibility before booking the module.

Mapping of Teaching Formats and Types of Media Used in the Programme Modules

Module Code	Module Name	Compulsory / Elective	Type of Assessment[1]	Teaching Formats[2]			Types of Media[3]					
				CF	ILSE	LS[4]	CB	RL	OT	RB	V	PE
LIBFWAWADLMDSPWP	Programming with Python	C	WAWA	X	X	X	X	X	X		X	
LIBFEXDLMDSAM	Advanced Mathematics	C	EX	X	X	X	X	X	X	X	X	X
LIBFWAWADLMARM-01	Advanced Research Methods	C	WAWA	X	X	X	X	X	X		X	
LIBFAWDLMDSAS	Advanced Statistics	C	AW	X	X	X	X	X	X	X	X	
LIBFEXDLMDSML	Machine Learning	C	EX	X	X	X	X	X	X		X	X
LIBFWAWADLMDSDL	Deep Learning	C	WAWA	X	X	X	X	X	X		X	
LIBFWAWADLMDSUCE	Use Case and Evaluation	C	WAWA	X	X	X	X	X	X		X	
LIBFWACSDLMDSME	Case Study: Model Engineering	C	WACS	X	X	X	X	X	X		X	
LIBFOARPDLMDSBDT	Big Data Technologies	C	OARP	X	X	X	X	X	X		X	
LIBFOARPDLMDSSEDIS	Software Engineering for Data Intensive Sciences	E	OARP	X	X	X	X	X	X		X	
LIBFAWDLMDSINDA	Industrial Automation	E	AW	X	X	X	X	X	X		X	
LIBFEXDLMDSEAAD1	Architectures of Self-Driving Vehicles	E	EX	X	X	X	X	X	X		X	X

LIBFIRPFSINTER	Internship3	E	IRP	X	X	X						
LIBFMTMMTHE	Master Thesis	C	MT									

This table shows the distribution of teaching formats and types of media used in the programme modules.

[1]EX = Exam, WAWA = Written assignment, WACS = Case study, WARE = Research essay, WAPR = Project report, P = Portfolio, AW = Advanced Workbook, OARP = Oral Assignment + Reflection Paper, OPRRP = Oral Project Report + Reflection Paper, BT/MT = Bachelor / Master Thesis

[2]CF = Course Feed, ILSE = Intensive Live Sessions, LS = Learning Sprints

[3]CB = Course Book, RL = Reading List, OT = Online Tests, RB = Review Book, V = Videos, PE = Practice Exams

[4]Offered only when the minimum number of participants is reached.

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[3] Check eligibility before booking the module.