



## BSc (Hons) Data Science

### Programme Specification

#### 1. General Information

UCAS Code	Award	Programme Title	Expected Duration	Study Mode
N/A	BSc (Hons)	Data Science	3 years 4 years 6 years	Full-time Part-time 1 Part-time 2
		Programme Code		
		UK-LIBF-BADSC		
	Exit Awards	<ul style="list-style-type: none"> <li>Diploma of Higher Education</li> <li>Certificate of Higher Education</li> </ul>		

Credit Count	<b>360 FHEQ credits</b>
Awarding Institution	The London Institute of Banking & Finance
Teaching Institution	The London Institute of Banking & Finance
Delivery Modes	<ul style="list-style-type: none"> <li>Face-to-face</li> <li>Blended</li> <li>Online - Synchronous</li> <li>Online - Asynchronous</li> </ul>

<b>Date of original production:</b> Month Year	<b>Date of current version:</b> Month Year
<b>Record of modifications:</b> 1) Month Year, 2) Month Year, 3) Month Year	

## 2. Programme Overview

### Programme Summary

As a core discipline and key enabler of digitalisation, the field of Data Science is rapidly growing and plays an essential role in many industries. With digitalisation processes continuing to advance and the amount of data generated continuing to increase, there is a growing need for graduates with strong data science skills.

The BSc (Hons) Data Science programme provides you with a comprehensive understanding of the fundamental concepts and principles of data science. The programme covers a range of topics such as machine learning, statistical analysis and data analysis and visualization. You also gain practical skills in programming languages such as Python and are introduced to the ethical considerations relevant to the field.

The programme also provides a wide range of electives which allows you to gain insights into industry-relevant fields and areas of practical application of data science such as Marketing and Sales, Transportation and Logistics, and Engineering and Finance.

### Programme Aims

The BSc (Hons) Data Science aims to

- provide you with an understanding of the fundamental concepts and theoretical underpinnings of data science, including mathematics, statistical methods, and machine learning as well as methodological subjects such as exploratory data analysis, and how these pertain to the field of data science as a whole.
- develop your knowledge of programming languages and core concepts of data science and their application to enable you to collect, manipulate, and analyse datasets.
- equip you with critical thinking and problem-solving skills to select and apply data science techniques to given problems, to assess the quality and validity of data and analysis results and draw meaningful insights from data.
- provide you with effective academic and project planning skills to manage and complete set tasks and data science projects.
- enhance your awareness of the ethical considerations in data science, enabling you to critically evaluate the ethical and societal impact of data science methods as a basis for responsible and ethical professional decision-making.
- provide you with a holistic understanding of data-driven decision-making through a wide-range of elective modules giving insights into industry-relevant fields and fields of practical application of data science.

## Employability & Graduate Outcomes

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

- digital, technical, and statistical literacy
- critical thinking and problem-solving skills
- communication and collaboration skills
- numerical and analytical skills
- professional responsibility and ethical awareness

### 3. 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 the Bachelor with Honours level (Level 6).

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

LO1	Demonstrate systematic knowledge and a critical understanding of the key aspects of mathematical and statistical fundamentals as well as methodological subjects and their formative relationship to current methods in data science. (C 4.6)
LO2	Demonstrate knowledge and a critical understanding of technical and engineering aspects of data science, such as data infrastructure, programming, and software engineering, and their supporting role in the professional practice of a data scientist. (C 4.6)
LO3	Demonstrate knowledge and a critical understanding of the ethical and social implications of data science and critically evaluate the ethical and societal impact of data science methods. (C 4.6)
LO4	Critically discuss and examine the main theories, principles, and methods of data science and identify, evaluate, and learn new data science tools and techniques to stay up to date with industry trends. (C 4.6)
LO5	Analyse and interpret complex data sets by implementing statistical methods and training machine learning models in the Python programming language. (C 4.6)
LO6	Apply critical thinking skills to assess the quality and validity of data and analysis results. (C 4.6)

LO7	Synthesise and communicate data-driven insights using appropriate visualization techniques and libraries to create clear and informative visualisations. (C 4.6)
LO8	Derive and define research questions and employ them to find solutions to problems in the field of data science. (C 4.6)
LO9	Demonstrate practical skills such that they are able to collect, clean, and pre-process data from various sources using programming languages and tools such as Python, SQL, and NoSQL databases. (C 4.6)
LO10	Apply data management and version control techniques to ensure reproducibility and maintainability of data science projects and demonstrate effective time management and project planning skills to complete data science projects on time. (C 4.6)
LO11	Integrate the skills and abilities of their acquired knowledge broadening into their professional activities in a targeted and structured manner and to reflect upon these. (C 4.6)
LO12	Demonstrate transferable skills such that they are able to independently familiarise themselves with new topics and problem areas with the help of the skills and problem-solving competencies they have acquired. (C 4.6)
LO13	Demonstrate transferable skills such that they are able to work and communicate effectively with diverse groups and demonstrate a professional and ethical conduct. (C 4.6)

#### 4. The Structure of the Programme

The BSc (Hons) Data Science programme is offered as a 3-year full-time programme or in part-time mode over a 4 or 6-year period.

The programme is divided into modules which include both compulsory and elective modules weighing 15 credits each and a thesis weighing 30 credits. All modules in the programme are assigned to one of three levels (L4/L5/L6) which reflect the depth of learning required in the relevant level and year of study.

To achieve a full-honours award, students need to complete modules with a combined weight of 360 credits, including the final thesis.

Table 1: Structure of the Programme

Module Code	Module Name	Level	Credit	Compulsory/ Elective
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Year 1				
LIBFOADLBDSIDS	Introduction to Data Science	4	15	C
LIBFEXDLBDSIPWP	Introduction to Programming with Python	4	15	C
LIBFEXDLBDSMFC	Mathematics: Analysis	4	15	C
LIBFEXDLBDSSPDS-01	Statistics – Probability and Descriptive Statistics	4	15	C
LIBFPDLBDSOOFPP	Object Oriented and Functional Programming with Python	4	15	C
LIBFOADLBDSQDW	Data Quality and Data Wrangling	4	15	C
LIBFEXDLBDSMFLA	Mathematics: Linear Algebra	4	15	C
LIBFEXDLBDSSIS	Statistics – Inferential Statistics	4	15	C
Year 2				
LIBFAWDLBCSIAW	Introduction to Academic Work	5	15	C
LIBFEXDLBCSDMDS	Database Modeling and Database Systems	4	15	C
LIBFAWDLBDSEDAV	Explorative Data Analysis and Visualization	5	15	C
LIBFAWDLBDSSESSE	Data Science Software Engineering	5	15	C
LIBFWACSDLBDSMLSL	Machine Learning – Supervised Learning	5	15	C
LIBFWACSDLBDSMLUSL	Machine Learning – Unsupervised Learning and Feature Engineering	5	15	C
Elective from Group A		5	15	E
Elective from Group A		5	15	E
Year 3				
LIBFWAWADLBDSNNDL	Neural Nets and Deep Learning	6	15	C
LIBFWAREDLBDSSECDS	Seminar: Ethical Considerations in Data Science	6	15	C
Elective from Group B		6	15	E
Elective from Group B		6	15	E
Elective from Group C		6	15	E

Elective from Group C		6	15	E
LIBFBTDLBBT	Bachelor Thesis	6	30	C

Table 2: List of Electives

Module Code	Module Name	Level	Credit	Subject Area*
Electives A (Level 5)				
LIBFOADLBDSMTP	Project: From Model to Production	5	15	n/a
LIBFOPRDLBDSPBDM	Project: Build a Data Mart in SQL	5	15	n/a
LIBFOPRDLBCSAPM	Agile Project Management	5	15	n/a
Electives B (Level 6)				
LIBFWAWADLBCSEBI1	Business Intelligence	6	15	BI&DA
LIBFWAPRDLBCSEBI2	Project: Business Intelligence	6	15	BI&DA
LIBFWAWADLBDSEAS1	Applied Sales I	6	15	S&M
LIBFWAWADLBDSEAS2	Applied Sales II	6	15	S&M
LIBFWAWADLBDSESCM1	Supply Chain Management I	6	15	SCM
LIBFWAWADLBDSESCM2	Supply Chain Management II	6	15	SCM
LIBFWAWADLBDSBDT	Big Data Technologies	6	15	DE&BD
LIBFWAWADLBDSCE	Cloud Computing	6	15	DE&BD
LIBFWAWADLBDSEAIS1	Artificial Intelligence	6	15	AI
LIBFPDLBDSEAIS2	Project: Artificial Intelligence	6	15	AI
LIBFWAWACB	Crypto and Blockchain	5	15	B&F
LIBFWAWAFT	FinTech	5	15	B&F

LIBFIRPFSINTER1	Internship I <sup>1</sup>	6	15	n/a
LIBFIRPFSINTER2	Internship II <sup>1</sup>	6	15	n/a
Electives C (Level 6)				
LIBFWAWAADA	Advanced Data Analysis	6	15	BI&DA
LIBFWAPRPDA	Project: Data Analysis	6	15	BI&DA
LIBFWAWADLBMSM1-01_E	Online Marketing	6	15	S&M
LIBFWAWADLBMSM2-01_E	Social Media Marketing	6	15	S&M
LIBFWAWADLBINGPE_E	Product Development in Industry 4.0	6	15	SCM
LIBFWAPRDLBIEPSPS	Project: Smart Product Solutions	6	15	SCM
LIBFWAWADE	Data Engineering	6	15	DE&BD
LIBFPPDE	Project: Data Engineering	6	15	DE&BD
LIBFWAWADLBDSEAD1	Self-Driving Vehicles	6	15	AI
LIBFWAREDLBDSEAD2	Seminar: Current Topics and Trends in Self-Driving Technology	6	15	AI

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BI&DA = Business Intelligence & Data Analytics	S&M = Sales and Marketing	B&F = Banking & Finance	SCM = Supply Chain Management & Industry 4.0
AI = Artificial Intelligence	D&BI = Data & Business Intelligence	DE&BD = Data Engineering & Big Data Technologies	

## 5. Teaching, Learning and Assessment

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

Our programmes are designed to:

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<sup>1</sup> Check eligibility before booking the module.

- 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

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<sup>2</sup> 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 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.

## 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).
- 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

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<sup>2</sup> Offered only when the minimum number of participants is reached.



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. The university keeps the compulsory and further reading 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 London Institute of Banking & Finance's General and Academic Regulations for Students.

Assessment strategies follow The London Institute of Banking & Finance's Code of Practice for Quality Assurance, Chapter 7: Assessment.

Assessment consists of both formative and summative approaches. The different types of assessment used by LIBF are detailed in the Types of Summative Assessment document.

Feedback and feedforward on formative and summative assessments will be provided in line with The London Institute of Banking & Finance's Code of Practice for Quality Assurance, Chapter 7: Assessment and the Assessment Feedback policy.

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

## 6. Credit and Award

### Credit Framework

The BSc (Hons) Data Science is made up of 360 FHEQ credits. One credit approximates to 10 student effort hours; therefore, the total course requires an average of 3,600 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, students will be awarded the

Bachelor Honours Degree	360 credits, of which at least 90 credits must be at Level 6
Bachelor's Degree (non-Honours)	minimum of 300 credits, of which at least 60 credits must be at Level 6

## Regulations

The London Institute of Banking & Finance'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, and
- capping of marks and regulations relating to the resitting of assessment components.

## Exit Awards

In line with The London Institute of Banking & Finance's General and Academic Regulations for Students, the following applies:

Diploma of Higher Education	minimum of 240 credits, of which at least 90 credits must be at Level 5
Certificate of Higher Education	minimum of 120 credits, of which at least 90 credits must be at Level 4

Note: The London Institute of Banking & Finance does not award interim qualifications. For example, a student registered for the bachelor's degree will not automatically be awarded a Diploma or Certificate of Higher Education on completion of the required number of credits.

## 7. Professional Recognition

Credits gained via APL into our awards may mean that students will not get certain exemptions from other institutions' higher education or professional awards that recognise our programme.

## 8. Criteria for Admission

All applications will be considered holistically and offers will be based on qualifications, subjects studied, any relevant work experience and personal statements demonstrating a desire to work in the relevant industry.

Students must be able to satisfy the general admissions criteria of The London Institute of Banking & Finance. Entry requirements for the BSc (Hons) Computer Science are:

	Grades	Old UCAS tariff	New UCAS tariff
'A' Levels	ABB - BBC	320 – 280	128 - 112

<b>BTEC</b>	D*DD – DDM	380 – 320	152 - 128
<b>IB</b>	32 - 28	435 – 348	New tariff is at component level
<b>Students are also required to hold:</b>			
<b>GCSEs</b>	<b>Old grading system</b>	<b>New grading system</b>	
<b>Maths</b>	A	7	
<b>English</b>	C	4	
<b>IELTS</b>	<b>Overall Score</b>	<b>Individual Elements</b>	
	6.0	5.5	

Entry at Level 5 still requires an applicant to meet the above requirements, however, if the applicant has studied at Level 4/5 at another university consideration is given to APL.

If the applicant is a non-native speaker of English, they also need to meet an IELTS grade of 6.0 overall or above with no element below 5.5 (or equivalent). Alternatively, evidence students have previously studied in English at an appropriate level and at a recognised institution, may be accepted.

Entry at Level 6 is only permitted where we have a specific arrangement with a partner organisation, or the applicant has previously studied with us and gained a relevant Diploma of Higher Education.

Offers of admission are normally based on 128-112 UCAS points or ABB-BBC at A Level (this excludes General Studies, Critical Thinking, Extended Projects, and Citizenship Studies). All applicants are usually required to hold a minimum of GCSE Maths Grade A or Grade 7, and above GCSE English Grade C or Grade 4. Ideally, applicants will have studied one of the following A Levels: Mathematics, Further Mathematics, Economics, Statistics, or Physics. We accept the BTEC Extended Diploma at D\*DD and the Diploma and Subsidiary Diploma along with other qualifications. We also accept the International Baccalaureate (32-28 points). We will consider a range of T-Level qualifications for entry. If applicants do not satisfy these criteria, they can communicate with the LIBF Admissions Team and discuss entry requirements.

Mature students who do not meet the entry criteria may be eligible to enrol under the LIBF mature student process. Applicants should contact a member of the Admissions Team if they do not meet the criteria.

## 9. Benchmarks

External:

- QAA UK Quality Code, including:

- Subject Benchmark Statement for Computing (2022)
- Level 6 descriptors in the Framework for Higher Education Qualifications in England, Wales and Northern Ireland
- Higher Education Credit Framework for England

#### Internal:

- The London Institute of Banking & Finance Code of Practice
- The London Institute of Banking & Finance 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 skill and knowledge gaps.

## 10. Links

Teaching, Learning and Assessment Strategy

[The London Institute of Banking & Finance's General and Academic Regulations for Students](#)

[The London Institute of Banking & Finance's Code of Practice for Quality Assurance, Chapter 3: Accreditation of Prior Learning \(APL\)](#)

[The London Institute of Banking & Finance's Code of Practice for Quality Assurance, Chapter 7: Assessment](#)

Types of Summative Assessment

Assessment Feedback Policy

[Subject Benchmark Statement for Computing](#)

[Framework for Higher Education Qualifications in England, Wales and Northern Ireland](#)

[Higher Education Credit Framework for England](#)

## 11. Curriculum Map of Modules against Intended Learning Outcomes of Programme

	Module Code	Module Name	Programme Learning Outcomes												
			LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13
Year 1	LIBFOADLBDSIDS	Introduction to Data Science	X		X	X									
	LIBFEXDLBDSIPWP	Introduction to Programming with Python		X							X				
	LIBFEXDLBDSMFC	Mathematics: Analysis	X			X									
	LIBFEXDLBDSSPDS-01	Statistics - Probability and Descriptive Statistics	X			X	X		X						
	LIBFPDLBDSOOFPP	Object Oriented and Functional Programming with Python		X							X	X		x	
	LIBFOADLBDSQDW	Data Quality and Data Wrangling				X	X	X			X				
	LIBFEXDLBDSMFLA	Mathematics: Linear Algebra	X			X									
	LIBFEXDLBDSSIS	Statistics - Inferential Statistics	X			X	X		X						
Year 2	LIBFAWDLBCSIW	Introduction to Academic Work								X			X		
	LIBFEXDLBCSDMDS	Database Modeling and Database Systems		X							X	X			
	LIBFAWDLBDSEDAV	Explorative Data Analysis and Visualization	X			X	X	X	X		X				
	LIBFAWDLBDSSE	Data Science Software Engineering	X	X		X		X				X	X		X
	LIBFWACSDLBDSMLSL	Machine Learning - Supervised Learning	X			X	X	X						X	
	LIBFWACSDLBDSMLUSL	Machine Learning - Unsupervised Learning and Feature Engineering	X			X	X	X	X					X	

	Elective from Group A														
	Elective from Group A														
Year 3	LIBFWAWADLBDSNNDL	Neural Nets and Deep Learning	X	X		X	X							X	
	LIBFWAREDLBDSSECDS	Seminar: Ethical Considerations in Data Science			X					X			X	X	X
	Elective from Group B														
	Elective from Group B														
	Elective from Group C														
	Elective from Group C														
	LIBFBTDLBBT	Bachelor Thesis				X	X	X	X	X		X	X	X	X
This table shows the distribution of the programme's learning outcomes (as specified in the programme specification) across the course modules.															

## 12. Mapping of Teaching Formats and Types of Media used in the Programme Modules

	Module Code	Module Name	Type of Assessment <sup>1</sup>	Teaching Formats <sup>2</sup>			Types of Media <sup>3</sup>					
				CF	ILSE	LS <sup>4</sup>	CB	RL	OT	RB	V	PE
Year 1	LIBFOADLBDSIDS	Introduction to Data Science	OA	X	X	X	X	X	X		X	
	LIBFEXDLBDSIPWP	Introduction to Programming with Python	EX	X	X	X	X	X	X		X	X
	LIBFEXDLBDSMFC	Mathematics: Analysis	EX	X	X	X	X	X	X	X	X	X
	LIBFEXDLBDSSPDS-01	Statistics - Probability and Descriptive Statistics	EX	X	X	X	X	X	X	X	X	X
	LIBFPDLBDSOOFPP	Object Oriented and Functional Programming with Python	P	X	X	X						
	LIBFOADLBDSQDW	Data Quality and Data Wrangling	OA	X	X	X	X	X	X		X	
	LIBFEXDLBDSMFLA	Mathematics: Linear Algebra	EX	X	X	X	X	X	X	X	X	X
	LIBFEXDLBDSSIS	Statistics - Inferential Statistics	EX	X	X	X	X	X	X	X	X	X
Year 2	LIBFAWDLBCSIAW	Introduction to Academic Work	AW	X	X	X	X	X	X		X	
	LIBFEXDLBCSDMDS	Database Modeling and Database Systems	EX	X	X	X	X	X	X		X	X

	LIBFAWDLBDSEDAV	Explorative Data Analysis and Visualization	AW	X	X	X	X	X	X		X	
	LIBFAWDLBDSDSSE	Data Science Software Engineering	AW	X	X	X	X	X	X		X	
	LIBFWACSDLBDSMLSL	Machine Learning - Supervised Learning	WACS	X	X	X	X	X	X		X	
	LIBFWACSDLBDSMLUSL	Machine Learning - Unsupervised Learning and Feature Engineering	WACS	X	X	X	X	X	X		X	
	Elective from Group A											
	Elective from Group A											
Year 3	LIBFWAWADLBDSNNDL	Neural Nets and Deep Learning	WAWA	X	X	X	X	X	X		X	
	LIBFWAREDLBDSSECDS	Seminar: Ethical Considerations in Data Science	WARE	X	X	X						
	Elective from Group B											
	Elective from Group B											
	Elective from Group C											
	Elective from Group C											
	LIBFBTDLBBT	Bachelor Thesis	BT									
This table shows the distribution of teaching formats and types of media used in the programme modules												
<sup>1</sup> EX = Exam, WAWA = Written assignment, WACS = Case study, WARE = Research essay, WAPR = Project report, P = Portfolio, AW = Advanced Workbook, OA = Oral Assignment, OPR = Oral Project Report, BT/MT = Bachelor / Master Thesis												



<sup>2</sup>CF = Course Feed, ILSE = Intensive Live Sessions, LS = Learning Sprints

<sup>3</sup>CB = Course Book, RL = Reading List, OT = Online Tests, RB = Review Book, V = Videos, PE = Practice Exams

<sup>4</sup>Offered only when the minimum number of participants is reached.