Programme Specification

1	**Awarding body**	University of London
2	**Teaching Institution**	**Birkbeck College**
3	**Programme Title(s)**	**BSc Data Science and Computing** **BSc Data Science and Computing with Foundation Year**
4	**Programme Code(s)**	UBSDCOMP_C (4-year part-time) UUBSDCOM_C (3-year full-time) UUBFDCOM_C (4-year full-time with Foundation Year)
5	**UCAS code (if applicable)**	I265/I266 (with Foundation Year)
6	**Home Department**	Computer Science and Information Systems
7	**Exit Award(s)**	Certificate of Continuing Education, Certificate of Higher Education, Diploma of Higher Education.
8	**Duration of Study** (number of years)	3 years FT, 4 years PT, 4 years FT with Foundation Year
9	**Mode of Study**	FT	X	PT	X	DL	
10	**Level of Award (FHEQ)**	6
11	**Other teaching depts or institution**	Management
12	**Professional, Statutory Regulatory Body(PSRB) details**	N/A
13	**QAA Benchmark Statement**	Computing

14	**Programme Rationale & Aims**

BSc Data Science and Computing:

The BSc Data Science and Computing is motivated by the growing demand for graduates with data analytics skills in industry. This BSc will cover the relevant foundations of mathematics, statistics and probability together with Data Science techniques and applications (60 credits). Programming (30 credits) and software engineering (30 credits) modules will conform to Institute of Coding standards as they are developed. Remaining modules will cover other technical and professional issues in computing and information systems of importance to Data Science.

BSc Data Science and Computing with Foundation Year:

The BSc Data Science and Computing with Foundation Year is designed for applicants who do not meet the entry requirements for direct entry to our BSc Data Science and Computing, who do not feel they are quite ready for an undergraduate level study, or who are returning to study after a significant break and need extra help and support.

The foundation year element of the Programme provides the core knowledge and skills required for the successful study of data science and computing at undergraduate level. It includes modules covering introductory, subject-specific areas such as mathematics,

computing and programming. It also includes more general skills modules, including approaches to study, academic writing and teamwork. Successful completion of the foundation year enables students to progress to the BSc element of the Programme.

The BSc stage of the programme equips students with a strong theoretical and technical grounding for working as a data scientist or analyst in industry. Apart from gaining a broad knowledge of computing and mathematics, students will acquire strong programming and data analysis skills using Java, Python, and R.

15	**Entry Criteria**

BSc Data Science and Computing:

UCAS tariff score: 112 – 128 points. This is applicable where students have recently studied a qualification that has a UCAS tariff equivalence.

We also welcome applicants without traditional entry qualifications as we base decisions on our own assessment of qualifications, knowledge and previous work experience. We may waive formal entry requirements based on judgement of academic potential.

Applicants without traditional entry qualification who wish to enter year 1 are required to sit an admissions test that is composed of two elements: (i) a mathematics test and (ii) a test of English comprehension. A pass in the mathematics test ensures that the applicant has the required quantitative skill base to progress through the programme. A pass in the English comprehension test indicates that the applicant is competent to begin the programme.

BSc Data Science and Computing with Foundation Year:

UCAS tariff score: 48 points. This is applicable where students have recently studied a qualification that has a UCAS tariff equivalence.

Applicants are expected to have GCSE grade C or new grade 4, or equivalent, in English and mathematics.

16	**Learning Outcomes**

On successful completion of this programme a student will be able to:

Foundation year only:

1. Write effectively in an academic context. (FY1)
2. Research and read effectively in an academic context. (FY2)
3. Demonstrate understanding of a range of core concepts in the area of computing and information systems. (FY3)
4. Work effectively in teams. (FY4)
5. Work independently to complete a small-scale research project. (FY5)

BSc Programme:

Subject Specific:

- mathematics, probability and statistics foundations of data science (S1),
- a knowledge of programming (S2),
- information systems design and social, legal and professional implications (S3),

- data and software engineering (S4),
- knowledge of data science tools, techniques and applications (S5).

Intellectual:
- the ability to develop an algorithm to carry out a specified data science task and to convert this into an executable program (I1),
- to successfully debug a program (I2),
- an appreciation of the social and legal implications of the use of computers (I3),
- the ability to analyse data using appropriate methods (I4),
- to plan and carry out a project with a focus on data science spanning several months (I5),
- to perform abstract thinking and to exhibit abstraction skills (I6).

Practical:
- the ability to write programs in appropriate programming languages (P1),
- to create and document a design using an appropriate modelling language (P2),
- to use tools to analyse data (P3).

Personal and Social:
- the ability to work under pressure (PS1),
- communicate using appropriate interpersonal skills (PS2),
- display competence when working in teams (PS3),
- take responsibility for own learning and time management (PS4).

17	**Learning, teaching and assessment methods**
	Formal lectures are the principal teaching method, but these frequently incorporate practical sessions, for example in programming, and also group exercises carried out in class.
	There is a large element of practical coursework which students carry out in their own time; some of these coursework assignments are carried out in groups.
	Each student also undertakes an individual project in data science (including background research) which is supervised by a member of staff. The project provides an opportunity for students to investigate in depth an aspect of data science that particularly interests them.
	Assessment is by the coursework assignments, written examinations and the project proposal and final report.

18	Programme Description
	This degree in data science and computing provides an excellent grounding for working as a data scientist or analyst in industry.
	As well as gaining a broad knowledge of areas of computing relevant to data science, you will acquire programming and data analysis skills and have the opportunity to investigate certain areas of data science more deeply.
	BSc Data Science and Computing with Foundation Year
	The BSc Data Science and Computing with Foundation Year provides a perfect route to study for those who:
	• Do not meet the entry requirements for direct entry to an undergraduate data science and computing degree.
	• Do not feel they are quite ready for undergraduate level study.
	• Are returning to study after a significant break and need extra help and support.
	The foundation year helps build confidence and provide skills to study successfully at undergraduate level.
	Upon successful completion of the foundation year, students automatically progress to the BSc part of the Degree. The BSc part focuses on developing key data and software development skills and knowledge, including data analytics, mathematics, computer programming, data security and database development and management.
	The Programme is studied full time over four years.

19	Programme Structure

Full Time 3- year programme

Year 1

Level	Module Code	Module Title	Credits	Status*
4	COIY040H4	Mathematics for Computing	15	Compulsory
4	BUCI007H4	Introduction to Programming	15	Compulsory
4	COIY068H4	Introduction to Database Technology	15	Compulsory
4	BUCI008H4	Introduction to Computer Systems	15	Compulsory
4	COIY016H4	Systems Analysis and Design I	15	Compulsory
4	BUCI069H4	Foundations of Data Science I	15	Compulsory
5	COIY018H5	Software and Programming 1	15	Compulsory
4	SSCS004H4	Introduction to Web Authoring	15	Compulsory

Year 2

Level	Module Code	Module Title	Credits	Status
5	BUCI030H5	Data Structures and Algorithms	15	Compulsory
5	BUCI066H5	Software Engineering I	15	Compulsory
5	BUCI070H5	Foundations of Data Science II	15	Compulsory
5	COIY019H5	Systems Analysis and Design II	15	Compulsory
6	COIY028H6	Database Management	15	Compulsory
5	BUCI036H5	Computer Networking	15	Compulsory
6	COIY030H6	Professional Issues in Computing	15	Compulsory
5/6		Option 1	15	Optional

Year 3					
Level	Module Code	Module Title	Credits	Status*	
6	BUCI072S6	BSc Data Science Project	30	Core	
6	BUCI045H6	Introduction to Data Analytics using R	15	Compulsory	
6	BUCI067H6	Software Engineering II	15	Compulsory	
6	BUCI034H6	Concepts of Machine Learning	15	Compulsory	
6	BUCI071H6	Data Science Applications and Techniques	15	Compulsory	
6	COIY045H6	Information Security	15	Compulsory	
6		Option 2	15	Optional	

Option modules from (indicative list):

Level	Module Code	Module Title	Credits	Status
6	BUCI048H6	Introduction to Semantic Technologies	15	Optional
5	SSCS019H5	JavaScript	15	Optional
5	BUCI044H5	Mobile Application Development	15	Optional
6	BUCI046H6	Wireless and Mobile Computing	15	Optional
6	BUCI032H6	Programming Language Paradigms	15	Optional
6	COIY026H6	Software and Programming II	15	Optional
6	BUCI053H6	Interactive Systems Design	15	Optional
5	COIY042H5	E-business	15	Optional
5	BUEM001S5	Calculus 2	30	Optional
6	BUCI028H6	Cloud Computing Concepts	15	Optional
6	COIY044H6	Enterprise Computing	15	Optional
5	SSCS018H5	Web Data with XML, JSON and AJAX	15	Optional
5	SSCS023H5	Building Web Applications Using MySQL and PHP	15	Optional
6	BUCI056H6	Software and Programming III	15	Optional
5	BUCI051H5	Advanced Web Authoring	15	Optional
6	COIY031H6	Strategic Information Systems	15	Optional

Part Time 4-year programme

Year 1					
Level	Module Code	Module Title	Credits	Status*	
4	COIY040H4	Mathematics for Computing	15	Compulsory	
4	BUCI007H4	Introduction to Programming	15	Compulsory	
4	COIY068H4	Introduction to Database Technology	15	Compulsory	
4	BUCI008H4	Introduction to Computer Systems	15	Compulsory	
4	COIY016H4	Systems Analysis and Design I	15	Compulsory	
4	BUCI069H4	Foundations of Data Science I	15	Compulsory	

Year 2

Level	Module Code	Module Title	Credits	Status*
4	SSCS004H4	Introduction to Web Authoring	15	Compulsory
5	BUCI030H5	Data Structures and Algorithms	15	Compulsory
5	BUCI066H5	Software Engineering I	15	Compulsory
5	BUCI070H5	Foundations of Data Science II	15	Compulsory
5	COIY019H5	Systems Analysis and Design II	15	Compulsory
5	COIY018H5	Software and Programming I	15	Compulsory

Year 3

Level	Module Code	Module Title	Credits	Status*
5	BUCI036H5	Computer Networking	15	Compulsory
6	COIY045H6	Information Security	15	Compulsory
6	BUCI045H6	Introduction to Data Analytics using R	15	Compulsory
6	BUCI067H6	Software Engineering II	15	Compulsory
6	COIY028H6	Database Management	15	Compulsory
5/6		Option 1	15	Optional

Year 4

Level	Module Code	Module Title	Credits	Status*
6	BUCI072S6	BSc Data Science Project	30	Core
6	COIY030H6	Professional Issues in Computing	15	Compulsory
6	BUCI034H6	Concepts of Machine Learning	15	Compulsory
6	BUCI071H6	Data Science Applications and Techniques	15	Compulsory
6		Option 2	15	Optional

Option modules (indicative list):

Level	Module Code	Module Title	Credits	Status*
6	BUCI048H6	Introduction to Semantic Technologies	15	Optional
5	SSCS019H5	JavaScript	15	Optional
5	BUCI044H5	Mobile Application Development	15	Optional
6	BUCI046H6	Wireless and Mobile Computing	15	Optional
6	BUCI032H6	Programming Language Paradigms	15	Optional
6	COIY026H6	Software and Programming II	15	Optional
6	BUCI053H6	Interactive Systems Design	15	Optional
5	COIY042H5	E-business	15	Optional
5	BUEM001S5	Calculus 2	30	Optional
6	BUCI028H6	Cloud Computing Concepts	15	Optional
6	COIY044H6	Enterprise Computing	15	Optional
5	SSCS018H5	Web Data with XML, JSON and AJAX	15	Optional
5	SSCS023H5	Building Web Applications Using MySQL and PHP	15	Optional
6	BUCI056H6	Software and Programming III	15	Optional
5	BUCI051H5	Advanced Web Authoring	15	Optional

6	COIY031H6	Strategic Information Systems	15	Optional

Full Time 4-year programme with Foundation Year

Foundation Year (0)

Level	Module Code	Module Title	Credits	Status*
3	BUCI075H3	Teamwork	15	Compulsory
3	BUCI076H3	Computing Foundation Year Project	15	Compulsory
3	CASE002S3	Fundamentals of Study: Learning through the Global City	30	Compulsory
3	BUCI084H3	IT Tools and Techniques	15	Compulsory
4	COIY067H4	Fundamentals of IT	15	Compulsory
4	BUCI085H3	Programming Logic	15	Compulsory
3	BUMN166H3	Mathematics for Business	15	Compulsory

Year 1

Level	Module Code	Module Title	Credits	Status*
4	COIY040H4	Mathematics for Computing	15	Compulsory
4	SSCS004H4	Introduction to Web Authoring	15	Compulsory
4	BUCI007H4	Introduction to Programming	15	Compulsory
4	COIY068H4	Introduction to Database Technology	15	Compulsory
4	BUCI008H4	Introduction to Computer Systems	15	Compulsory
4	COIY016H4	Systems Analysis and Design I	15	Compulsory
4	BUCI069H4	Foundations of Data Science I	15	Compulsory
5	COIY018H5	Software and Programming 1	15	Compulsory

Year 2

Level	Module Code	Module Title	Credits	Status*
5	BUCI036H5	Computer Networking	15	Compulsory
5	BUCI030H5	Data Structures and Algorithms	15	Compulsory
5	BUCI066H5	Software Engineering I	15	Compulsory
5	BUCI070H5	Foundations of Data Science II	15	Compulsory
5	COIY019H5	Systems Analysis and Design II	15	Compulsory
6	COIY030H6	Professional Issues in Computing	15	Compulsory
6	COIY028H6	Database Management	15	Compulsory
5 or 6		Option 1	15	Optional

Year 3

Level	Module Code	Module Title	Credits	Status*
6	BUCI067H6	Software Engineering II	15	Compulsory
6	COIY045H6	Information Security	15	Compulsory
6	BUCI072S6	BSc Data Science Project	30	Core
6	BUCI045H6	Introduction to Data Analytics using R	15	Compulsory
6	BUCI034H6	Concepts of Machine Learning	15	Compulsory
6	BUCI071H6	Data Science Applications and Techniques	15	Compulsory

6		Option 2	15	Optional
Optional Modules (indicative list)				
6	BUCI048H6	Introduction to Semantic Technologies	15	Optional
5	SSCS019H5	JavaScript	15	Optional
5	BUCI044H5	Mobile Application Development	15	Optional
6	BUCI046H6	Wireless and Mobile Computing	15	Optional
6	BUCI032H6	Programming Language Paradigms	15	Optional
6	COIY026H6	Software and Programming II	15	Optional
6	BUCI053H6	Interactive Systems Design	15	Optional
5	COIY042H5	E-business	15	Optional
5	BUEM001S5	Calculus 2	30	Optional
6	BUCI028H6	Cloud Computing Concepts	15	Optional
6	COIY044H6	Enterprise Computing	15	Optional
5	SSCS018H5	Web Data with XML, JSON and AJAX	15	Optional
5	SSCS023H5	Building Web Applications Using MySQL and PHP	15	Optional
6	BUCI056H6	Software and Programming III	15	Optional
5	BUCI051H5	Advanced Web Authoring	15	Optional
6	COIY031H6	Strategic Information Systems	15	Optional

Status*

CORE – Module must be taken and passed by student

COMPULSORY – Module must be taken, mark can be reviewed at sub-exam board

OPTIONAL – Student can choose to take this module

24	**Programme Director**	Taolue Chen
25	**Start Date** *(term/year)*	PT Autumn 2018, FT Autumn 2019, FT with FY Autumn 2020
26	**Date approved by Education Committee**	Summer 2018
27	**Date approved by Academic Board**	Summer 2018
28	**Date(s) updated/amended**	16 February 2021 (for 2021/22)