Programme Specification for Postgraduate Programme Leading to:
MSc Data Science and Analytics
Postgraduate Diploma Data Science and Analytics
Postgraduate Certificate Data Science

Applicable for all postgraduate students starting in 2020

Version No.	Date	Notes – QA USE ONLY	QA
2020-21 v1.0	*12 June 2020*	*Major modifications to programme including the addition of a staged masters for September 2020 start.*	*JP*
2020-21 v1.1	*6 October 2020*	*Programme details confirmed for a 2020/21 start.*	*JP*

Postgraduate Taught Programme	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London
3. Home college/department/division	College of Engineering, Design and Physical Sciences/ Dept of Computer Science/Computer Science
4. Contributing college/department/division/associated institution	LBIC for Alternative Level 4 (see section 25)
5. Programme accredited by	Not Accredited
6. Final award(s) and FHEQ Level of Award	FHEQ Level 7 MSc Data Science and Analytics PG Diploma Data Science and Analytics PG Cert Data Science
7. Programme title	MSc Data Science and Analytics
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	MSc: Full time, 12 months (1 academic year) Part time, 24 months (2 academic years) Where students commence their programme at pre-Masters Level in LBIC, the normal length stated above will vary as follows: Pre-Masters January Level commencement (with placement): + 6 months Pre-Masters Level May commencement (without placement): + 4 months Staged study: PGCert: Part-time only, 12 months (1 year) PGDip: Part-time only, 12 months (1 year) + PGCert MSc: Part-time only, 12 months (1 year) + PGDip
10. Maximum period of registration for each mode of study	FT - Normal length of programme plus 2 years PT – Normal length of programme plus 2 years Staged study: The maximum period of registration for each stage shall be the normal length of the programme plus one year. The maximum period to complete the MSc (from registration on the PGCert to completing the MSc) is 6 years.
11. Variation(s) to September start	None for Standard Levels; See document “Validated Programme Element Specification for LBIC Generic Pre-Masters (with and without work placement)” for Alternative pre-Masters Level entry points
12. Modes of study	Full-time, Part-time and Staged Part-time
13. Modes of delivery	Standard delivery on-campus.

14. Intermediate awards and titles and FHEQ Level of Award	PG Certificate in Data Science (FHEQ L7) PG Diploma in Data Science and Analytics (FHEQ L7)
15. UCAS Code	N/A
16. HECoS Code	100366
17. Route Code	I200PDATA

18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	UK Quality Code for Higher Education QAA Subject Benchmark Statement Brunel University London 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the 'Managing Higher Education Provision with Others' page.
19. Admission Requirements	Details of PGT entry requirements are provided on the University's and College website. Levels of English for non-native speakers are outlined on Brunel International's language requirements
20. Other relevant information (e.g. study abroad, additional information on placements)	
21. Programme regulations not specified in Senate Regulation 3. Any departure from regulations specified in Senate Regulation 3 must be stated here and approved by Senate.	N/A
22. Further information about the programme is available from the College website.	Course webpage

23. EDUCATIONAL AIMS OF THE PROGRAMME

Data science is a new and emerging field in both academic and industry terms. Data science provides a pipeline between academic disciplines – its coverage is consequently wide. Most obviously, because interaction with the data is critical to any analysis, those who work with data need substantial and creative IT skills. Common conceptions combine computer science (acquisition and parsing of data), mathematics, statistics and data mining (filtering and mining of data), graphic design (representation and refinement of data) and information visualisation (interaction with data). On top of this, however, there is much that: (a) Behavioural science can offer (in terms of the way that people consciously and unconsciously perceive/attend to and interpret data) and, in addition, how careful analysis can be used to 'nudge' behaviour to ensure that products/services are used to best effect; and (b) management science can offer in relation to understanding innovation, value and business models.

Consequently, data science requires what are increasingly termed as 'T-shaped' practitioners – having a strong grounding in the core disciplines of information and computer science and statistics for example, but partnered with a broad appreciation of aspects of the other reference disciplines noted. Our broad academic rationale is that the higher-educational sector does not serve the intellectual needs of the market particularly well. Whilst many courses deal with aspects related to data analytics and business intelligence systems, they often: (a) Fail to address reference disciplines in a T shaped manner; (b) fail to appreciate the complex nature of such environments and the latest in conceptual and technical thinking; (c) ignore the realities and complexities of real-world applications of such ideas; and (d) fail to reflect on the philosophy, use and implications of such principles in such a context.

With the above in mind, the aim of the programme is to develop a critical awareness of the state-of-the-art in data science and demonstrate the practical skills necessary to create value in its application to business, scientific and/or social domains.

In addition to the subject contents relevant to data science, the students will have the opportunity to develop a broader set of skills including study skills, research skills, employment skills and capability skills through teamwork (e.g. the group projects), guest lectures or workshops from industry, and dissertation projects with industrial collaborations.

24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

The programme provides opportunities for students to develop and demonstrate knowledge and understanding (K) cognitive (thinking) skills (C) and other skills and attributes (S) in the following areas:

FHEQ Level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Masters Award Only	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associated Modular Blocks Code(s)
7						
7	C K	Comprehend and synthesise the key concepts from the disciplines defining modern data science.		CS5802 CS5801 CS5805 CS5803 CS5811 CS5809 CS5806 CS5810	CS5701 CS5702 CS5705 CS5703 CS5706 CS5709 CS5710	
7	C K	Demonstrate a critical understanding of the challenges and issues arising from taking heterogeneous data at volume and scale, understanding what it represents and turning that understanding into insight for business, scientific or social innovation.		CS5802 CS5801 CS5805 CS5803 CS5811 CS5809 CS5806 CS5810	CS5701 CS5702 CS5705 CS5703 CS5706 CS5709 CS5710	
7	K S	Evaluate, select, combine and apply data science tools and techniques to problems in social, business and/or scientific domains.		CS5801 CS5803 CS5811 CS5810	CS5701 CS5702 CS5703 CS5706 CS5710	
7	K S	Critically evaluate the role of data science in addressing problems in social, business and/or scientific domains.		CS5809 CS5804	CS5709 CS5704	CS5500
7	C K	Evaluate the effectiveness of applied data science in relation to the challenges/issues addressed.		CS5802 CS5806	CS5702 CS5706	CS5500
7	S	Conduct, report and evaluate a significant programme of research related to the problems and challenges of data science.		CS5804	CS5704	CS5500
7	S	Demonstrate competencies appropriate to professional practice related to data science and analytics		CS5804	CS5704	CS5500

Learning/teaching strategies and methods to enable learning outcomes to be achieved, including formative assessments

In relation to the learning outcomes above:

- Lectures are (generally) used to deliver relevant material.
- One or more guest lectures from industry are normally provided in study blocks where relevant.
- Seminars and group tutorials are (generally) used to apply acquired knowledge via exercises and/or to develop critical insight and reflect on material.
- Practical laboratory sessions are (generally) used to both demonstrate and apply key approaches, tools and techniques etc.
- Presentations or workshops are used to develop communication skills and to provide immediate formative feedback to students.
- Directed private study is used to (a) supplement and consolidate the points above and (b) broaden individual knowledge and understanding the subject matter.
- Group projects and professional practice are used to develop employability skills. Also a dedicated supervisor will be assigned to each group to provide continuous support and formative feedback to students during the whole process.
- Personal tutoring is integrated together with the group project supervision.
- Content delivery, practical sessions and assessments (generally) use real-life data and examples.

Summative assessment strategies and methods to enable learning outcomes to be demonstrated.

The assessment of all learning outcomes above is achieved by a balance of coursework and examinations (as detailed in the individual module specifications). Assessments range in form from written reports/essays through to conceptual/statistical modelling and programming exercises, according to the demands of particular modules. Additionally, in class tests are used to assess a range of knowledge, including a range of specific technical subjects.

25. Programme Structure, progression and award requirements

Programme structures and features: levels, assessment blocks, credit and progression and award requirements

- **Compulsory block:** one which all students registered for the award are required to take as part of their programme of study. These will be listed in the left hand column;
- **Optional block:** one which students choose from an 'option range'. These will be listed in the right hand column**;**
- A **core assessment** is an assessment identified within an assessment block or modular block (either compulsory or optional) which must be passed (at grade C- or better) in order to be eligible to progress and to be eligible for the final award. All core assessments must be specified on the programme specification next to the appropriate assessment or modular block:

  Where students are expected to pass the block at C- or better, but not necessarily all elements, then the block itself is core.
  e.g. AB5500 Project (40)
  Core: Block

  Where only some elements of assessments are required to be passed at C- or better, these will be identified by listing each element that is core
  e.g. ABXXX1 Title (XX credits)
  Core: 1 & 4

  Where students are expected to pass all assessments in a block then this will be identified. By setting the assessment this way, students are also required to pass the block by default. This will be identified thus:
  e.g. ABXXXX Title (XX credits)
  Core: All, Block

- A **non-core assessment** does not have to be passed at grade C- or better, but must D- or better in order to be eligible for the final award.

FHEQ Level 7	
Compulsory assessment block codes, titles and credit *Students studying a **staged masters** will take the assessment blocks identified as PGCert or PG Dip dependent on the stage they are at.* **PGCert** CS5801 Modern Quantitative Data Analysis (15 credits) CS5802 Critical Analysis of Modern Data (15 credits) CS5803 Data Visualisation (15 credits) CS5804 Research Project Management (15 credits) **PGDip** CS5805 Ethics and Governance of Digital Systems (15 credits) CS5806 Machine Learning (10 credits) CS5809 Digital Innovation and Strategy (15 credits) CS5810 High Performance Computational Infrastructures (5 credits) CS5811 Distributed Data Analysis (15 credits) Part Time Scheme of Studies Year 1 Term 1 – CS5801 Modern Quantitative Data Analysis; CS5802 Critical Analysis of Modern Data Term 2 – CS5803 Data Visualisation; CS5804 Research Project Management Year 2 Term1 – CS5805 Ethics and Governance of Digital Systems; CS5809 Digital Innovation and Strategy Term 2 – CS5806 Machine Learning; CS5810 High Performance Computational Infrastructures; CS5811 Distributed Data Analysis	**Optional assessment block codes, titles and credits** N/A
Compulsory study block codes, titles and credit volume *Students studying a **staged masters** will take the study blocks identified as PGCert or PG Dip dependent on the stage they are at.* **PGCert** CS5701 Quantitative Data Analysis (15 credits) CS5702 Modern Data (15 credits) CS5703 Data Visualisation (15 credits) CS5704 Research Project Management (15 credits) **PGDip** CS5705 Ethics and Governance of Digital Systems (15 credits) CS5706 Machine Learning (15 credits) CS5709 Digital Innovation and Strategy (15 credits) CS5710 High Performance Computational Infrastructures (15 credits) Part Time Scheme of Studies Year 1 Term 1 – CS5701 Quantitative Data Analysis; CS5702 Modern Data Term 2 – CS5703 Data Visualisation; CS5704 Research Project Management Year 2 Term1 – CS5705 Ethics and Governance of Digital Systems; CS5709 Digital Innovation and Strategy Term 2 – CS5706 Machine Learning; CS5710 High Performance Computational Infrastructures	**Optional Study block codes, titles and credit volume** N/A

Compulsory modular block codes, titles and credits	**Optional modular block codes, titles and credits**
*Students studying a **staged masters** will take the dissertation in their third year.* **MSc** CS5500_CB Dissertation (60 credits) Part Time Scheme of Studies Year 2 - (part time) Term 3 – CS5500_CB Year 3 (part time staged masters)	N/A

FHEQ Level 7 Progression and Award Requirements

As per Senate Regulation 3

A PGDip may be awarded by substitution of the dissertation (CS5500) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.

Pre-Masters Level

Pre-Masters Level structure available to international students is specified in document "Validated Programme Element Specification for LBIC Generic Pre-Masters (with and without work placement)". This document also specifies the admission and progression requirements.

Please note: this specification provides a concise summary of the main features of the programme and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods can be found in the modular block, assessment and study block outlines and other programme and block information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a modification occurs.