



Programme Specification

Data Science [Frenchay]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Data Science [Frenchay]

Highest award: MSc Data Science

Interim award: PGCert Data Science

Interim award: PGDip Data Science

Awarding institution: UWE

Teaching institutions: UWE

Study abroad: No

Year abroad: No

Sandwich year: No

Credit recognition: No

School responsible for the programme: FET Dept of Computer Sci & Creative Tech, Faculty of Environment & Technology

Professional, statutory or regulatory bodies:

British Computer Society (BCS)

Modes of delivery: Full-time, Part-time

Entry requirements:

For implementation from: 01 September 2020

Programme code: INB112

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: Data Science is a new discipline requiring data handling skills combined with statistics and programming. In addition, it is vital to have knowledge of the kind of domain-specific issues where data-informed decision making and process improvements are needed.

The programme includes a new set of core modules plus new options - with both Computer Science (CSCT) and Engineering, Design and Mathematics (EDM) inputs - but also integrates existing relevant M-level modules which have seen successful uptake from CPD applicants as short courses and which align well with staff research interests.

A key aspiration for the MSc Data Science is the fostering of collaboration and a learning community of students, staff, alumni and industrial / international partners.

UWE's MSc will be distinctive in leveraging departmental and inter-faculty links to align teaching (including case studies and datasets) with sustainable development goals in environment, energy, health and resource management.

Features of the programme:

Educational Aims: To enable graduates to progress to senior and leading data science-related roles (such as Data Scientist, Data Engineer, Data Analyst) in their organisation with scope and ability to develop organisational data-related capabilities, strategies and operations;

To develop resourceful, creative and independent thinkers able to adapt and respond to changing requirements, capabilities and opportunities in the data science space;

To foster confidence in working with data and managing associated concerns across multiple dimensions of data literacy;

Through data-oriented interventions, to enable graduates to impact on organisational efficiency and productivity as well as societal challenges such as those relating to the built and natural environment, health, agriculture and energy.

Programme Learning Outcomes:

On successful completion of this programme graduates will achieve the following learning outcomes.

Programme Learning Outcomes

- PO1. Be able to construct questions and hypotheses relating to organisational objectives and to identify experiments or gather data bearing on these
- PO2. Using techniques such as statistical inference, machine learning, text and data analytics, to develop descriptive, predictive and prescriptive models and analyses adhering to good statistical practice.
- PO3. Select, employ and evaluate platforms, tools and data storage and management technologies and to build data pipelines and production-ready analytic products.
- PO4. Use scripting languages and good coding practice together with relational and NoSQL data querying (including data transformation and integration of diverse sources) to design, prototype and develop data science solutions
- PO5. Continually evaluate and improve models and systems to ensure they meet requirements and objectives
- PO6. Communicate the outcome of analyses to multiple stakeholders through verbal and multimedia reporting
- PO7. Embody legal, ethical and societal desiderata through highly informed and reflexive practice
- PO8. Work cooperatively and collaboratively across functions and teams and show leadership and an outcomes-driven mindset.

Assessment strategy: Alongside assessment of competence with fundamental concepts through exams (particularly in the core modules focusing on data, coding and statistics), the programme's assessments are designed to track individual and team-based competency development through a focus on practical projects and the assessment of both process and product.

Delineation of problems and experimental design will be assessed in the inference module and the group project (PO1)

The design and execution of statistical models, code and data structures are assessed as part of practical coursework and exam, with seen question used in some cases to give students adequate preparation time (PO2-4). Good ethical and legal practice will also be assessed explicitly in these modules (PO7).

Oral assessment in the group project and the core statistics model will be used to assess face to face communication of technical analyses (PO6). Group working and continuous enhancement is built in to process assessment in the interdisciplinary group module (PO5, PO8).

All modules, and especially the group project, will focus on real-world problems and datasets, with a requirement for students to demonstrate the ability to research , apply and share relevant techniques as they would in the workplace.

Through the use of the artifact-based research projects in the group project and dissertation, students will have an opportunity to bring together new skills in statistics, data management and technical development in capstone projects, where there will be the option to focus on a business problem from their own organizations or from those suggested by industrial partners.

Student support: Espresso Programming and Espresso Maths are regular drop-in sessions where students can work on individual problems with staff members.

Part B: Programme Structure

Year 1

Full time students must take 180 credits from the modules in Year 1.

Part time students must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules (Full Time)

Full time students must take 150 credits from the modules in Compulsory Modules (Full Time).

Module Code	Module Title	Credit
UFCF9Y-60-M	CSCT Masters Project 2022-23	60
UFCFLR-15-M	Data Management Fundamentals 2022-23	15
UFCFWQ-45-M	Interdisciplinary Group Project 2022-23	45
UFCFVQ-15-M	Programming for Data Science 2022-23	15
UFMFHR-15-M	Statistical Inference 2022-23	15

Year 1 Compulsory Modules (Part Time)

Part time students must take 90 credits from the modules in Compulsory Modules (Part Time).

UFCF9Y-60-M CSCT Masters project module is started in year one and continued in Year two.

Module Code	Module Title	Credit
UFCF9Y-60-M	CSCT Masters Project 2022-23	60
UFCFLR-15-M	Data Management Fundamentals 2022-23	15
UFCFVQ-15-M	Programming for Data Science 2022-23	15

Year 1 Optional Modules (Full Time)

Full time students must take 30 credits from the modules in Optional Modules (Full Time).

Students will be informed of possible option combinations when making choices.

Module Code	Module Title	Credit
UFMFJR-15-M	Advanced Statistics 2022-23	15
UFCF8H-15-M	Big Data 2022-23	15

UFCFKR-15-M	Business Intelligence and Data Visualisation 2022-23	15
UFCFKJ-15-M	Cloud Computing 2022-23	15
UFCFEY-15-M	Data and Information Governance 2022-23	15
UFCE8J-15-M	Designing the User Experience 2022-23	15
UFCFGD-15-M	Knowledge Management 2022-23	15
UFCFLJ-15-M	Linked, Open Data and the Internet of Things 2022-23	15
UFCFMJ-15-M	Machine Learning and Predictive Analytics 2022-23	15
UFCFJJ-15-M	Social Media and Web Science 2022-23	15

Year 1 Optional Modules (Part Time)

Part time students must take 30 credits from the modules in Optional Modules (Part Time).

Students will be informed of possible option combinations when making choices.

Module Code	Module Title	Credit
UFMFJR-15-M	Advanced Statistics 2022-23	15
UFCF8H-15-M	Big Data 2022-23	15
UFCFKR-15-M	Business Intelligence and Data Visualisation 2022-23	15
UFCFKJ-15-M	Cloud Computing 2022-23	15
UFCFEY-15-M	Data and Information Governance 2022-23	15
UFCE8J-15-M	Designing the User Experience 2022-23	15
UFCFGD-15-M	Knowledge Management 2022-23	15

UFCFLJ-15-M	Linked, Open Data and the Internet of Things 2022-23	15
UFCFMJ-15-M	Machine Learning and Predictive Analytics 2022-23	15
UFCFJJ-15-M	Social Media and Web Science 2022-23	15

Year 2

Part time students must take 60 credits from the modules in Year 2.

Year 2 Compulsory Modules (Part Time)

Part time students must take 60 credits from the modules in Compulsory Modules (Part Time).

UFCF9Y-60-M CSCT Masters project module is started in year one and continued in Year two.

Module Code	Module Title	Credit
UFCFWQ-45-M	Interdisciplinary Group Project 2023-24	45
UFMFHR-15-M	Statistical Inference 2023-24	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Graduates will exhibit analytical skills in problem framing and project design, data manipulation and retrieval, statistics and coding for data analysis. They will be able to develop and evaluate models, use established tools and methods, and effectively communicate their results to stakeholders. They will be able to work in a multifunctional team and manage a full development lifecycle.

Part D: External Reference Points and Benchmarks

Programme development has been part-funded under the Institute of Coding (IoC), and OfS funded project where UWE is part of a consortium of 33 universities and over 100 employers developing accessible technology education courses, training and events.

Part of the IoC project is to develop new programme certification and accreditation, and UWE's involvement will help to ensure that the MSc will be eligible for this.

Although not yet fully developed, it is expected that programme accreditation will be linked to new data competencies under Level 7 of SFIA (Skills Framework for the Information Age).

We are also participating in a project activity on shared curriculum tools and content for data science.

Programme design and curriculum has also been influenced by the EU-Horizon 2020 EDISON Data Science Framework (Data Science Competence Framework , Data Science Body of Knowledge and Model Curriculum)

Part E: Regulations

Approved to University Regulations and Procedures.