



## **Module Specification**

### **Data Management Fundamentals**

Version: 2024-25, v2.0, 04 Jun 2024

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## Part 1: Information

**Module title:** Data Management Fundamentals

**Module code:** UFCFLR-15-M

**Level:** Level 7

**For implementation from:** 2024-25

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**College:** College of Arts, Technology and Environment

**School:** CATE School of Computing and Creative Technologies

**Partner institutions:** None

**Field:** Computer Science and Creative Technologies

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** Yes

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** This module will introduce a range of fundamental and contemporary data management issues, techniques and tools that may be applied across the programme.

**Features:** Not applicable

**Educational aims:** To introduce and cement key aspects of data management and form a foundation for further specialisation in data analytics.

**Outline syllabus:** 1) Relational modelling and key data management concepts

FAIR (Findable, Accessible, Interoperable) principles in data management

CAP, BASE and ACID design principles

Constructing and reverse-engineering entity relationship models

Data normalisation

Referential integrity and master data management

Data processing models (batch, streaming, parallel)

2) Database construction

Forward engineering

Keys, indexes and constraints

3) Data querying and manipulation

SQL basic (create, retrieve, update and delete) and advanced methods

Query profiling and optimisation

4) Data cleansing and aggregation

Removing and refactoring

Transforming and joining

Anonymisation

5) NoSQL stores

Defining

Difference to RDBMS

Query and aggregation syntax

6) Architectures

Data warehousing and batch operations (OLAP, OLTP, ETL)

Data science pipelines

Cloud and distributed data stores

Partitioning and scaling

7) Data Management in Practice

Environments Deployment

Migration and integration

Backup and recovery and disaster/breach mitigation

8) Security, Environmental and Ethical issues

Impact of data centres and mitigating climate footprint

Data security and good governance

Privacy

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** As a lab-based module, teaching will centre around practical work and a range of individual and group challenges, scaffolded by worked examples and real-life case studies.

Alongside hands-on design tasks in class, students will be required to use self-study time to become familiar with data manipulation and definition language syntax

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Understand, evaluate and apply the relational model to structure data using a range of data query and manipulation languages and frameworks.

**MO2** Design, develop and validate a range of data models and schemas incorporating a critical reflection on the value and ethical concerns of data.

**MO3** Demonstrate competence with theoretical and practical aspects of enterprise data methods and strategies.

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 126 hours

Face-to-face learning = 24 hours

Total = 0

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/6A9F5E72-1B5F-9D6B-5868-821E168F1FCD.html) via the following link <https://rl.talis.com/3/uwe/lists/6A9F5E72-1B5F-9D6B-5868-821E168F1FCD.html>

**Part 4: Assessment**

**Assessment strategy:** Formative assessment will be employed via automated tools and peer and tutor feedback to monitor and improve basic skills.

Students will then undertake an individual design project presented as a portfolio which will be the main assessed coursework incorporating evidence of their ability to design, develop, apply and validate data queries and demonstrating an understanding of strategic, operational and ethical issues in data management.

The resit will be the same as the first sit.

**Assessment tasks:****Portfolio (First Sit)**

Description: Individual modelling, database design and implementation tasks appropriate to data management fundamentals

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

**Portfolio (Resit)**

Description: Individual modelling, database design and implementation tasks appropriate to data management fundamentals.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

## **Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Data Science [NepalBrit] MSc 2024-25

Data Science [GCET] MSc 2024-25

Data Science [Frenchay] MSc 2024-25

Data Science [Frenchay] MSc 2024-25

Data Science [Frenchay] MSc 2024-25

Data Science [Frenchay] MSc 2024-25

Financial Technology [Frenchay] MSc 2024-25

Financial Technology [Frenchay] MSc 2024-25