Module Specification

Programming for Data Science

Version: 2026-27, v2.0, Approved

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Part 1: Information

Module title: Programming for Data Science

Module code: UFCFVQ-15-M

Level: Level 7

For implementation from: 2026-27

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: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module introduces students to principles of data science and programming with a range of applications to appropriate domains.

Features: Not applicable

Educational aims: This module is intended for students with little or no programming experience but also for those keen to improve their programming skills. It aims to provide students with an understanding of the role computation can play in

solving problems and, regardless of their background, feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals.

Outline syllabus: The module will cover the following indicative topics:

Introduction:

Introduction to the field of data science;
Developing a working knowledge of common development tools used in the context of data science (such as Jupyter Notebooks, Visual Studio Code and Git).

Basic Programming and Algorithm Design:

Principles of programming through the Python programming language (such as variables, flow control and data structures);
Use of appropriate IDE or an approved virtual programming environment for the practical sessions;
Procedural implementation of statistical algorithms.

Data analytics practices:

Introduction to popular data analysis and statistical learning tools and frameworks (such as Pandas, Numpy and Matplotlib);
Develop an understanding the concept of data structures (such as Lists, Dictionaries, Sets, Arrays and DataFrames);
Learn how to read in data into Pandas' Data Frames, how to query these structures, how to generate summary tables, data groupings, and how to clean and manipulate data;
Develop skills in Data Visualisation to support numerical data analysis.

Part 3: Teaching and learning methods

Teaching and learning methods: Teaching and learning will be based on practical workshops preceded by demonstration lectures to enable the students to prepare for the weekly topics. In the workshops, students will problem solve under the guidance of module tutors.

Additional support will be available through tutor office hours and our Espresso Programming help.

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

MO1 Explain, demonstrate and critically evaluate programming constructs and data structures.

MO2 Develop, document and rigorously test functions for solving data science problems, demonstrating best practices for code maintainability.

MO3 Select, integrate and compare software libraries for data manipulation, data analysis and visualisation.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ufcfvq-15-m.html

Part 4: Assessment

Assessment strategy: The assessment strategy for this module is a single coursework assignment.

The assignment is a highly interactive one, wherein students are expected to demonstrate and present their code solutions. One-to-one and immediate feedback

is provided, which enriches and deepens the on-going learning of the student. Summative assessment is achieved through this demonstration of a set of programming exercises solutions together with the submission of a reflective development process report. The reflective report should focus on the process taken to develop solutions. In particular, identifying any strengths/weaknesses in their approach, suggestions for improvements, and any alternative approaches that could have been taken.

Resit Assessment Strategy: Students will be required to submit a single coursework assignment with the same structure as described above, i.e. a set of programming exercises and a reflective development process report.

Assessment tasks:

Practical Skills Assessment (First Sit)
Description: Practical coursework
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3

Practical Skills Assessment (Resit)
Description: Practical coursework
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 [Frenchay] MSc 2026-27

Data Science [Frenchay] MSc 2026-27

Data Science [Frenchay] MSc 2026-27

Data Science [Frenchay] MSc 2026-27

Data Science [GCET] MSc 2026-27

Data Science [NepalBrit] MSc 2026-27

Data Science {with International Pre-Masters} [UWEBIC] MSc 2026-27