Module Specification

Practical Data Science

Version: 2026-27, v1.0, 20 Jan 2025

Contents

Part 1: Information

Module title: Practical Data Science

Module code: UFCEJ4-15-2

Level: Level 5

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: Data science and analytics is an exciting, rapidly evolving discipline that offers enormous potential for the future of computer science. Keeping up with the rapidly evolving field of a modern data scientist requires fundamental data wrangling and machine learning modelling skills. This module is designed to introduce students to programming and statistical concepts frequently used within data science, with a clear practical element in the form of a real-world data analysis.

Features: Not applicable

Educational aims: The purpose of this module is to introduce data analysis and interpretation, sources of data, methods of data presentation and description, and how to create/interpret simple machine learning models. On completion of the module, there should be an ability to understand appropriately utilise machine learning to support business requirements. Students should further be able to better understand, and critique machine learning analysis encountered in academic papers in subsequent courses.

Outline syllabus: Basic probability theory, statistical distributions, and the nature of statistical investigations

Bayesian and Frequentist statistics

Descriptive Statistics – Data central tendency, variance and distribution

Statistical Inference – Drawing conclusions using statistical tests

Introduction to basic modelling for machine learning, eg:

Regression modelling,

Classification,

Clustering

Part 3: Teaching and learning methods

Teaching and learning methods: Learning and teaching will be provided to students through lectures and computer labs. During lectures, theoretical aspects of the module will be provided to students by the teaching staff. Lectures will be supported by presentation published and available to the students on Teams as well as additional materials (publications, videos, etc.).

Computer labs are devoted to practical data analysis using modern software. A mixture of R and Python will be used for illustration of techniques and output analysis; students are permitted to use R or Python for lab work. Computer lab classes are reserved for requirement clarifications, problem discussion, and assessment. Students are expected to continue expand their experience through working independently outside the classes.

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

MO1 Evaluate fundamental concepts in data science, e.g. data distributions, variance, central tendency, and key assumptions used within machine learning models.

MO2 Demonstrate and explain the use of descriptive statistics to formulate real-world problems as data science problems.

MO3 Apply a range of machine learning techniques to an existing dataset and obtain well-grounded business insights performing a statistical analysis.

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://rl.talis.com/3/uwe/lists/E177A5EC-57D9-EF8C-1D2E-FC5CAC32C66E.html

Part 4: Assessment

Assessment strategy: This module has been designed with one key assessment for students to demonstrate a comprehensive understanding of Data Analytics through a small project and a poster defence.

· Poster defence – Creation of a poster demonstrating the methodology and results

of a small data analytics project.

In the assessment students will be required to complete a small research project based on provided real-world data using either R or Python and one of the machine learning techniques covered previously.

Students will work in groups of 3-4 and will be expected to split the tasks equally. Once the project is finished, they must formulate their results in the form of a poster. They will be expected to present a poster defence to a module tutor. This poster defence is expected to take 20 minutes, followed by questions and discussion.

Grading and feedback will be individually assessed based upon contribution, collaboration and input towards the group objective and predefined tasks.

Resit opportunities will follow the same format as the first sit, with an alternate dataset provided.

Assessment tasks:

Poster (First Sit)
Description: The group poster defense involves the creation of a poster and presentation to apply knowledge in solving data and statistical problems (20-minute presentation + discussion and questions)
Weighting: 100 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2, MO3

Poster (Resit)
Description: The group poster defense involves the creation of a poster and presentation to apply knowledge in solving data and statistical problems (20-minute presentation + discussion and questions).

Where groups are not possible during resist opportunities, an individual poster defense may be used with appropriate time adjustments.

Weighting: 100 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Software Development [UCW] FdSc 2025-26