



## **Module Specification**

### **Advanced Statistics**

Version: 2023-24, v2.0, 25 Jan 2023

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## Part 1: Information

**Module title:** Advanced Statistics

**Module code:** UFMFJR-15-M

**Level:** Level 7

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Computer Sci & Creative Tech

**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:** In this module, students will learn advanced statistical modelling techniques for complex data using modern statistical programming software. This module will cover dimension reduction, data visualisation, supervised and unsupervised learning, in the framework of creating reproducible research.

**Features:** Not applicable

**Educational aims:** This module is concerned with the application of modern statistical methods suitable for modelling complex data. There will be extensive use of statistical computer packages,

On successful completion of this module students will be able to

- 1) produce reproducible statistical research using modern programming tools
- 2) identify appropriate exploratory data analysis techniques and then combine appropriate modelling techniques for a variety of situations
- 3) assess model diagnostics to inform empirical model building
- 4) interpret and explain a wide variety of statistical models in different contexts to both expert and non-expert audiences
- 5) examine limitations of inference from statistical models based on model evaluation techniques

**Outline syllabus:** Supervised learning

Random Forests

Unsupervised learning (clustering)

Semi-supervised learning

Dimension reduction (Principal Component Analysis/ Factor Analysis)

Variable selection

Visualisation

### Part 3: Teaching and learning methods

**Teaching and learning methods:** The learning will take place in PC lab tutorials and lectorials working on empirical dataset

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

**MO1** assess model diagnostics to inform empirical model building

**MO2** interpret and explain a wide variety of statistical models in different contexts to both expert and non-expert audiences

**MO3** identify appropriate exploratory data analysis techniques and then combine appropriate modelling techniques for a variety of situations

**MO4** examine limitations of inference from statistical models based on model evaluation techniques

**MO5** produce reproducible statistical research using modern programming tools

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Lectorials = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmfjr-15-m.html) via the following link <https://uwe.rl.talis.com/modules/ufmfjr-15-m.html>

### Part 4: Assessment

**Assessment strategy:** Formative assessment will be delivered throughout the module.

Summative assessment will be in the form of an assessment of practical and

analytical skills, understanding and application of knowledge using a an individual coursework submission based on a data analytics scenario.

**Assessment tasks:****Written Assignment (First Sit)**

Description: Individual course work report. 2000 words.

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

**Written Assignment (Resit)**

Description: Individual course work report. 2000 words.

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Data Science [GCET] MSc 2023-24

Data Science [NepalBrit] MSc 2023-24

Data Science [Frenchay] MSc 2023-24

Data Science [Frenchay] MSc 2023-24

Artificial Intelligence [Frenchay] MSc 2023-24