



Module Specification

Statistical Inference

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Part 1: Information

Module title: Statistical Inference

Module code: UFCE8W-15-M

Level: Level 7

For implementation from: 2023-24

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 concentrate on developing specific transferable skills:

Scripting using appropriate programming languages for data analysis such as R
Best practices of reproducible research.

Automating production of reports / analysis by practicing reproducible research using tools such as RStudio and knitR

Data visualisation

This module will also provide an overview of best practices of using statistical methods to create and build models to analyse data.

Features: Not applicable

Educational aims: The aim of this module is to provide a sound understanding of the role of statistical inference in the field of data science.

This will extend to including best practice in study design and in understanding the consequences of working with "found" rather than designed data.

Embedded within the module will be the principles of reproducible research and the data modelling cycle.

Outline syllabus: Introduction to the concepts of reproducible research using R / Rmarkdown.

Use of data analysis plans.

Exploratory Data Analysis - highlighting the importance of visualisation as an analysis tool as well as a communication tool.

Data Management and metadata.

Hypothesis testing - using both traditional methods and simulation approaches.

Model building using a statistical framework.

Model selection and validation

Part 3: Teaching and learning methods

Teaching and learning methods: The module, presented via our online virtual learning environment, consists of a clearly signposted, easy-to-navigate student journey through carefully chosen learning materials which are designed to engage and challenge students as they work towards achieving the module learning outcomes. Content may be in a range of formats, including clear well-written text, diagrams, animations, video and interactive video, activities, quizzes, asynchronous discussions, coding and interpretation exercises.

Students will be provided with as many opportunities as possible to 'perform their understanding' rather than just reading or watching video to passively acquire knowledge. This may be in the form of simple tasks, activities or quizzes that students can engage with in the online environment, or larger pieces of work that may require additional thought. Whatever their nature, such tasks will be authentic (connected to the real world) and directly relevant to the programme learning outcomes.

The online environment also provides important opportunities to encourage students to work with, and learn from, their peers. The careful use of structured online discussion forums helps to foster an active learning community and enable students to share their responses to key questions, and to discuss, and even challenge, each other's ideas.

All learning materials are produced and presented in a way that ensures that they are appropriate for as diverse an audience as possible. We follow W3C accessibility standards and ensure that all content can be used with all popular screen-readers, offering alternative formats where possible. In general, we aim to avoid using language, idioms, images or other devices which root the content in any particular culture or creed that instead adequately reflect the diversity of the student audience.

In general, modules are designed with a number of key learning principles in mind that align closely with those of the university.

Use of flipped learning approaches will feature at appropriate stages during the module. Part of the flipped learning approach will be the expectation that students will create initial attempt at solving a problem, using appropriate code, prior to being provided with suggested solutions and guidance. These will be used as a method of formative assessment / opportunity for formative feedback.

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

MO1 Apply the principles of statistical inference to solve problems.

MO2 Communicate the findings of the results of statistical analysis to specific audiences.

MO3 Design, develop and validate a range of statistical models.

MO4 Understand and implement the data modelling cycle.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

E-learning/online learning = 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/ufmfhr-15-m.html) via the following link <https://uwe.rl.talis.com/modules/ufmfhr-15-m.html>

Part 4: Assessment

Assessment strategy: Formative assessment will be delivered throughout the module; where students will be encouraged to explain their approaches to their peers and then give feedback to others.

Summative assessment will be in the form of an online examination designed to be completed within two hours.

Assessment tasks:

Examination (Online) (First Sit)

Description: Online examination designed to be completed within 2 hours.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (Resit)

Description: Online examination designed to be completed within 2 hours.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Data Science [UWE online] MSc 2023-24