Module Specification

Statistical Applications

Version: 2024-25, v3.0, 08 Jul 2024

Contents

Part 1: Information

Module title: Statistical Applications

Module code: UFMFPV-30-2

Level: Level 5

For implementation from: 2024-25

UWE credit rating: 30

ECTS credit rating: 15

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: Statistical Investigations 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module advances critical and analytic thinking using quantitative research methodology. It expands the data handling skills developed at level 4, including greater awareness of different data sources, formats, and applications.

Students will be equipped with tools that they will use to analyse real problems involving 'messy' or 'big' data. The skills developed in this module are applied to an even broader range of settings in level 6 modules. This is a key module within the

programme in which formal report writing and data visualization is developed and assessed.

As part of problem solving, students will critically evaluate and apply appropriate statistical software, including statistical programming language(s) alongside programming language(s) taught in other modules.

Features: Not applicable

Educational aims: This module provides core knowledge of statistical techniques and ensures students developcritical and analytic thinking using quantitative research methodology.

Specifically, students will study fundamental statistical techniques that underpin the analysis of data, with an emphasis on more advanced techniques that involve multiple repeated measures, multiple factors or non-continuous dependent variable.

Outline syllabus: Key concepts in statistical inference
Introduction to R statistical software
Sampling distributions and Bayesian statistics
ANOVA and nonparametric equivalents
Multiple regression
Regression diagnostics and transformations
Binary logistic regression
Time series

Part 3: Teaching and learning methods

Teaching and learning methods: The delivery is designed to promote active learning, comprising interactive lectures, problem-based computer practicals, and lectorials.

The delivery has an emphasis on the use of statistical software, including that seen at level 4, and software introduced in this module. Continued use of software expands data handling skills, awareness of different data, and tools to analyse

'messy' data. Therefore, as concepts are introduced during lectures, they will be illustrated by examples that demonstrate the use and interpretation of software. To complement this, computer practicals will involve students completing actual data analysis using software. Lectorials provide flexible opportunities for combining the two above approaches.

Lectures also provide space for critical and analytic thinking that does not require software. Therefore lectures will introduce theoretical statistical concepts and provide active learning through engaging with solving examples.

Students develop skills in formal report writing and data visulaization through assessment, and also through a continued emphasis on output and communication throughout the delivery. All examples (both in course notes and computer practicals) show a complete data analysis, so that all examples demonstrate the features of a statistical analysis and how these may be critiqued in a formal report. All computer practicals are based around preparing computer output for a formal report, so that feedback and feed-forward on the summative report-writing is strengthened by feedback and feed-forward during computer practicals.

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

> **MO1** Analyse and solve statistical problems using probability theory, and statistical inference

> **MO2** Identify, execute and evaluate appropriate statistical analyses for research questions, including those that involve multiple groups or independent variables

> **MO3** Select and apply statistical software to aid statistical analyses, including those that involve multiple repeated measures, multiple factors or non-continuous dependent variables.

> **MO4** Communicate the results, conclusions, strengths and limitations of statistical analyses through a formal report

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 0

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/833B0783-74AA-7C5E-3912-0CD2DBD3D6A5.html

Part 4: Assessment

Assessment strategy: Module assessment is designed to allow students to demonstrate their achievement of the learning outcomes, while minimising the amount of assessment necessary for this.

The coursework task of the assessment requires students to communicate data analyses in a formal report. This is specifically one of the learning outcomes. Through a formal report, students will also demonstrate that they can identify appropriate statistical analyses for the report, and apply appropriate statistical software.

The exam task takes the form of a partially seen online examination at the end of the module. The partially-seen format allows for exam preparation, in which students identify appropriate statistical analyses for the exam questions, and apply appropriate statistical software. The examination also assesses students' ability to analysis and solve problems using probability and statistical inference theory. Partially-seen exams reduce the assessment burden by reducing anxiety associated with surprise, and allowing for focused preparation.

The resit assessment strategy is the same as for first sit.

Assessment tasks:

Examination (Online) (First Sit)

Description: Online examination with partially seen or partially redacted questions (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Report (First Sit)

Description: Written report of maximum 15 pages including supporting material

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4

Examination (Online) (Resit)

Description: Online examination with partially seen or partially redacted questions (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Report (Resit)

Description: Written report of maximum 15 pages including supporting material

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mathematics [Frenchay] BSc (Hons) 2023-24

Mathematics {Foundation} [Frenchay] BSc (Hons) 2022-23

Mathematics with Qualified Teacher Status {Foundation} [Sep][FT][Frenchay][3yrs] - Not Running BSc (Hons) 2022-23