



Module Specification

Statistical Practice

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Part 1: Information

Module title: Statistical Practice

Module code: UFMF7W-15-3

Level: Level 6

For implementation from: 2022-23

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Computer Science and Creative Technologies

Module type: Standard

Pre-requisites: Statistical Applications 2021-22

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides core knowledge of quantitative research methodology, statistical techniques and their careful application, all grounded in real-life problems encountered in the life sciences. The module prepares students to work as a methodologist and statistician.

Students will study the scientific approach to quantitative research, and further

develop knowledge in statistical techniques and their application. A holistic approach is embedded in the module, covering the rationale, research hypotheses, ethics, statistical design, statistical hypotheses, data collection and storage, statistical reasoning and testing, communication, and inference in a study.

Features: Not applicable

Educational aims: The aim of this module advances critical and analytic thinking in quantitative research methodology. Students will develop skills to deconstruct empirical research enquiry, and to appreciate methods of data collection and their limitations, to analyse the data from such problems including challenging data structures arising from missing data, and in the development of research protocols. 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.

Outline syllabus: Outline Syllabus:

The Scientific Method and positioning of research

Research Protocols

Questionable Research Practice

Critical reading of empirical literature

The design and analysis of clinical trials

Challenges and solutions to missing data

Sample size requirements

Modern computer intensive approaches to inference

Modelling techniques (survival models, discrete choice modelling, mixed linear models)

Diagnostic measures

Prediction and classification

Part 3: Teaching and learning methods

Teaching and learning methods: The delivery is designed to promote active learning, comprising pre-class reading, keynote lectures, problem-based computer

practicals, and lectorials.

The computer practicals have an emphasis on the use of statistical software; this time will be used to help solve real world problems. The lectorials are design to develop reasoning, understanding of problems and their solution, and the communication of what can, and cannot, be inferred. Both the practicals and lectorials provide active learning through engaging with real examples which may have multiple good but different answers.

Students develop skills in critical appraisal, problem deconstruction and solution, and professional communication. All examples used are real examples drawn from consultancy or from emerging problems in the life and health sciences.

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

MO1 Contribute to the development of a research protocol

MO2 Identify, execute, and evaluate appropriate statistical analyses for various research questions, including those that involve missing data.

MO3 Appraise quantitative research.

MO4 Communicate the results, conclusions, strengths, limitations and further recommendations for statistical analyses through methods appropriate for professional statistical practice.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/C816EE7B-4026-9523-5B7A-AE43D3652CA5.html?draft=1&lang=en-US&login=1) via the following link <https://rl.talis.com/3/uwe/lists/C816EE7B-4026-9523-5B7A-AE43D3652CA5.html?draft=1&lang=en-US&login=1>

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.

There are three task based problems

Task 1 requires the student to help a medical team complete a work-in-progress research protocol which is needed by a funding panel and an ethics committee.

Task 2 requires the student to complete the Methods section, Results Section, and contribute to the Conclusions section of a work-in-progress journal article.

Task 3 is a critique of a journal article, and an evaluation of a large data set requiring statistical modelling.

The resit assessment strategy has the same format as the first sit assessment

Assessment components:

Report - Component A (First Sit)

Description: Component A comprises a critique of a journal article, and the analysis of a large data set using advanced techniques

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3, MO4

Report - Component A (First Sit)

Description: This assessment requires the student to help a medical team complete a work-in-progress research protocol which is needed by a funding panel and an ethics committee (max 10 pages)

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

Report - Component A (First Sit)

Description: This assessment requires the student to complete the Methods section, Results Section, and contribute to the Conclusions section of a work-in-progress journal article (max 5 pages)

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO4

Report - Component A (Resit)

Description: This work will comprise equivalent tasks to the components at module first attempt and will cover all learning outcomes.

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3, MO4

Report - Component A (Resit)

Description:

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

Project - Component A (Resit)

Description:

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mathematics [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21

Mathematics [Sep][SW][Frenchay][4yrs] BSc (Hons) 2019-20

Mathematics {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2018-19