

FP060-15 Statistics for Science

22/23

Department

Warwick Foundation Studies

Level

Foundation

Module leader

Joel Milburn

Credit value

15

Module duration

25 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module will demonstrate how mathematics is an interdisciplinary subject, with particular attention to the life sciences.

Module aims

This module aims to develop students' ability to view mathematics as an interdisciplinary subject and to equip students with the mathematical knowledge and skills required to manipulate data. It aims to develop skills for the application of statistical and mathematical methods in the Life Sciences.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Number skills

- Decimal and standard form
- SI units and conversion
- Exponentials and logs

Statistics: representing data, measures of location and dispersion

- Statistical variables and measurements
- Frequency distribution (including graphs)

Simple probability and probability distributions

- Calculating probability
- Probability distribution (discrete)
- Normal distribution

Population and sample, sampling distribution

- Populations and Samples
- Standard error
- Parametric and non-parametric statistics

Inferential statistics

- Confidence intervals
- Hypothesis testing
- t-tests

Learning outcomes

By the end of the module, students should be able to:

- Accurately use mathematical notation, terminology, conventions and units and interpret in mathematical terms verbal, graphical and tabular information
- Apply a range of statistical methods to real-world problems in order to provide supporting information to draw evidence based conclusions
- Manipulate, analyse and interpret data using computer software in order to justify conclusions

Indicative reading list

Field, A.P. (2018) Discovering statistics using IBM SPSS. Sage Publications., London.

Emden, H. (2019) Statistics for Terrified Biologists. Blackwell Publishing, USA

Aitken, M. and Broadhurst, B and Hladky, S. (2010) Mathematics for Biological Scientists. Garland Science, USA

Howell, D.C. (2017). Fundamental statistics for the behavioral sciences. W. Ross MacDonald School Resource Services Library, Brantford, Ontario.

Interdisciplinary

This module supports other scientific disciplines through the learning of statistical analysis methods and mathematical software which are widely used across these empirical disciplines.

Data is sourced and analysed from within the context of these other disciplines.

Subject specific skills

Students will develop a core understanding of key statistical concepts, with a focus on the application of these fundamental principles within other scientific disciplines. Students will develop a familiarity with the language and terminology of mathematics and will be encouraged to think creatively and critically and identify trends and patterns.

Transferable skills

Students will develop their organisational, time management, computing and communication skills. Students will learn to select and manage information drawn from books, experiments, and the internet. Students will learn to make value judgements about their own work and the work of peers.

Study

Study time

Type	Required
Seminars	24 sessions of 2 hours (38%)
Private study	80 hours (62%)
Total	128 hours

Private study description

To develop new knowledge and understanding for this module students should undertake activities such as reading in relation to the subject areas covered, critical analysis of data, practice questions, group work and preparation for assignments.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A2

	Weighting	Study time
Data analysis	60%	20 hours
Analysis of data using IT software to produce a written report of length 4-5 pages (Note: word count is not applicable)		
Assessment 1	40%	10 hours
Variety of exam style questions on learning up to the midpoint of the module.		

Feedback on assessment

Through Tabula

Availability

Courses

This module is Core for:

- FIOE Warwick International Foundation Programme
 - Year 1 of FP21 Warwick International Foundation Programme - Life Sciences
 - Year 1 of FP22 Warwick International Foundation Programme - Psychology