

Liverpool John Moores University

Title: RESEARCH METHODS FOR BIOSCIENCES
Status: Definitive
Code: **5012NATSCI** (119217)
Version Start Date: 01-08-2014

Owning School/Faculty: Natural Sciences & Psychology
Teaching School/Faculty: Natural Sciences & Psychology

Team	Leader
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Academic Level: FHEQ5 **Credit Value:** 24.00 **Total Delivered Hours:** 48.00
Total Learning Hours: 240 **Private Study:** 192

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	17.000
Tutorial	10.000
Workshop	21.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Scientific report	40.0	
Essay	Essay	Timed essay	35.0	
Portfolio	Portfolio	Portfolio from statistics workshops	25.0	

Aims

To widen knowledge and experience of research, increase understanding of the statistical analysis of data, the use of statistical software programmes such as SPSS and the interpretation and presentation of statistical results in a scientific report.

Learning Outcomes

After completing the module the student should be able to:

- 1 Determine and apply the appropriate experimental design to a given experiment or survey
- 2 Choose appropriate methods to statistically analyse data and interpret analysis produced by a computer-based statistical package (SPSS)
- 3 Report biological research in a coherent scientific report and present statistical results in an appropriate format
- 4 Perform literature searches and critically evaluate journal articles

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Scientific Report	1	2	3	4
Timed Essay	4			
Stats Workshop	1	2		

Outline Syllabus

Principles of experimental design; completely randomised, randomised block & Latin square designs. Literature searching. Report writing. Data Analysis: Practical aspects of data analysis; transformation of data to meet assumptions. Modelling biological processes with the Poisson distribution. Testing hypotheses with the binomial distribution. One and two way analysis of variance and associated post-hoc tests e.g. Tukey test. Non-parametric equivalents of ANOVA, e.g. Kruskal Wallis, Scheirer-Ray-Hare. Testing for associations using correlations. Modelling linear relationships using simple and multiple regression.

Learning Activities

The module is delivered through lectures, workshops, tutorials and directed study. The module extends knowledge of research design and statistical techniques suitable for the analysis of data from field and laboratory practicals and projects using the statistical package SPSS.

Notes

This module considers the fundamentals of conducting research from research design, literature searching, data collection and statistical analysis using examples for biologists.