

## Liverpool John Moores University

Title: FUNDAMENTALS OF SCIENTIFIC RESEARCH  
Status: Definitive  
Code: **4201NATSCI** (122037)  
Version Start Date: 01-08-2021

Owning School/Faculty: Biological and Environmental Sciences  
Teaching School/Faculty: Biological and Environmental Sciences

Team	Leader
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**Academic Level:** FHEQ4      **Credit Value:** 20      **Total Delivered Hours:** 54  
**Total Learning Hours:** 200      **Private Study:** 146

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	22
Tutorial	10
Workshop	22

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	Statistics	Students are assessed on their knowledge of statistics and data analysis and presentation.	45	
Report	Comms	Students are assessed on their ability to apply skills of searching for, using and correctly referencing scientific information and synthesizing and communicating scientific information in an appropriate style.	45	
Future	Reflection	This will give insight into the	10	

Category	Short Description	Description	Weighting (%)	Exam Duration
Focus e-learning task		student's ability of self-evaluation and their understanding of the needs in their future work environment.		

## Aims

*To enable students to develop a range of academic, research and transferable skills related to their programme of study.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Search for, assess and make use of scientific information, citing sources of information in the required format and avoiding academic misconduct.
- 2 Collate, synthesise and present scientific information in a formal scientific written style.
- 3 Convert raw data to results by arranging data into appropriate tables and meaningful subsets, applying appropriate descriptive and statistical tests and correctly interpreting and reporting the results of these analyses.
- 4 Reflect upon aspects of personal and career development including strengths, weaknesses, motivations, values, skills and qualities, in order to fully exploit learning opportunities in the field of scientific research at the University and beyond.

## Learning Outcomes of Assessments

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

Statistical Data Analysis	3		
Scientific Communication	1	2	4
Future Focus	4		

## Outline Syllabus

*Three broad themes are covered: 'scientific communication'; 'statistical data analysis, data handling and presentation'; 'careers and employability'.*

*The 'Scientific communication' theme includes an introduction to 'the scientific literature' and how science is communicated; how to search for, access and understand scientific information; how to think critically when approaching scientific information; how to organize and present fully referenced information in a formal scientific style suitable for a scientific publication.*

*The 'Statistical data analysis, data handling and presentation' theme includes an introduction to aspects of data handling (e.g. tabulation, data cleaning), summarizing (e.g. descriptive statistics, data distributions), presentation (e.g. plotting and understanding graphs), study design and statistical analysis (e.g. testing for differences in independent or paired continuous data, testing for correlation or association among continuous or categorical variables, goodness of fit of categorical data).*

*The 'Careers and Employability' theme involves self-reflection on skills, qualities and motivations relevant to future careers and employability.*

## **Learning Activities**

The module is delivered through lectures, online lectures, workshops, tutorials and directed study. Lectures and workshops on scientific study skills introduce topics such as finding, understanding, critically assessing and using scientific information, study design, scientific writing and presenting scientific information. Lectures and workshops on statistical data analysis introduce data handling and statistical analysis techniques suitable for the analysis of data from field and laboratory studies using up-to-date statistical software and tools.

## **Notes**

This module aims to develop the fundamental research skills of students on biological sciences degree programmes. Aspects of these include accessing and understanding scientific information, critical thinking and study design, scientific writing and referencing, data handling and statistical analysis. In addition, information and self-reflection relevant to future careers and employability is covered.