Fundamentals of Scientific Research

Module Information

2022.01, Approved

Summary Information

Module Code	4201NATSCI
Formal Module Title	Fundamentals of Scientific Research
Owning School	Biological and Environmental Sciences
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Biological and Environmental Sciences

Learning Methods

Learning Method Type	Hours
Lecture	22
Tutorial	10
Workshop	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	28 Weeks

Aims and Outcomes

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

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Search for, assess and make use of scientific information, citing sources of information in the required format and avoiding academic misconduct.
MLO2	2	Collate, synthesise and present scientific information in a formal scientific written style.
MLO3	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.
MLO4	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.
MLO5	5	Discuss topics and complete learning activities relevant to the module and wider programme in small group tutorials.

Module Content

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 concept of 'Big Data' in the biosciences is introduced, and the advantages and challenges of handling and analysing very large datasets.The 'Careers and Employability' theme involves self-reflection on skills, qualities and motivations relevant to future careers and employability.
Module Overview	This module aims to develop your research skills and covers problem solving, scientific writing, data handling and statistical analysis.
Additional Information	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 (including 'Big Data' approaches to analyse large datasets). In addition, information and self-reflection relevant to future careers and employability is covered.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Statistical Data Analysis	35	0	MLO3
Report	Scientific Communication	35	0	MLO1, MLO2, MLO4
Future Focus e-learning task	Future Focus	10	0	MLO4
Practice	Tutorial Assessment	20	0	MLO5

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Gareth Weedall	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings