Fundamentals of Scientific Research

Module Information

2022.01, Approved

Summary Information

Module Code	4501YAUGEN
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	20
Workshop	20

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-PAR	PAR	September	12 Weeks

Aims and Outcomes

Aims	In this module, you will be introduced to key skills that you will need as a scientist. Science is a process in which the scientist (you) makes a hypothesis about how the world works, devises a way to test that hypothesis and by these experiments either disproves or does not disprove that hypothesis. As well as doing experiments, you must interpret the results, consider them in the context of other scientific results and report them in a formalised way. Therefore, the fundamentals of scientific research include:-Thinking about something, asking questions in a 'scientific' way, making hypotheses-Doing scientific experiments and analysing experimental data-Interpreting results-Reporting experiments and results This module will introduce you to these elements of being a scientist. You will get the most benefit from this module by trying to make links between what you do here and what you cover in other, more subject-specific, modules. What you learn in this module will be relevant to your entire degree course. For example, learning how to do statistical data analysis here will lay the foundations for more complex data analysis in future years of study and you will actually have to apply these analyses when you do your research project in your final year. Learning how to communicate your science (in writing or graphs) will be useful for every future module that requires you to read scientific papers (i.e. all of them), write a report of experimental work and of course your research project.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Recognise scientific approaches and how to apply them in order to solving problems.
MLO2	2	Perform independent research and present the results using appropriate techniques, such as graphing, mapping, tables or text.
MLO3	3	Convert raw data to results by arranging them into meaningful subsets, applying appropriate descriptive or statistical tests and correctly interpreting and reporting the results of these analyses.
MLO4	4	Develop a range of transferable skills in order to fully exploit learning opportunities in the field of scientific research at University and beyond by identifying and reflecting upon the following aspects of personal development: strengths and weaknesses, motivations and values, ability to work with others.

Module Content

Outline Syllabus	Syllabus StructureFundamentals of Scientific Research is taught in three parts:Scientific Writing and Reporting: Students will learn about the fundamentals of scientific writing in this module. They will learn how to find scientific information, how to read and write scientific material including correct formatting and plagiarism. They will also learn how to design experiments, think critically and present the data correctly. Data Handling and Statistical Analysis: Students will learn how to collect data, how to analyse it statistically and how interpret their findings. Mini Research Project: In this module students will apply their knowledge of scientific writing and statistical and data analysis that they have gained in the previous two modules. They will propose a hypothesis, investigate a problem, collect data and present their results using an appropriate scientific reporting style.
Module Overview	
Additional Information	In this module students will apply their knowledge of scientific writing and statistical and data analysis. They will propose a hypothesis, investigate a problem, collect data and present their results using an appropriate scientific reporting style and assist individuals to develop an understanding of how to work with data sets, process raw data and apply the correct statistical tests.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping

Exam	Multiple Choice Exam	40	1	MLO1
Report	Scientific Report	60	0	MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Rachael Symonds	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings