

CNWX40100 Advanced Research Skills for Biological Scientists
MODULE DESCRIPTOR ('08/09)

Title	Advanced Research Skills for Biological Scientists		
Code	CNWX40060		
Credits	5		
Semester	2-3		
Level	4		
Co-ordinator	Clare O'Connor		
Contributors	Caroline Gill, NOVA (CPR); Mairead Cashman (Data Analysis); David Brayden, Alan Baird (Integrity in Scientific Research) and Clare O'Connor (Science & Society)		
Module Places	Places will be limited to the number of computer laboratory spaces available for the the Data Analysis sessions		
Module Dependencies	Students will have to have completed the Introduction to Core Research Skills for Laboratory Scientists (CNWX40080)		
Indicative Module Descriptor:			
This module encompasses four different areas of skill development and learning for research students:			
<ul style="list-style-type: none"> ○ Basics of Data Analysis for Experimental Biologists (4 x 3 hr computer-based sessions) ○ Commercialisation and Patenting of Research (2 x 3 hr sessions) ○ Integrity in Scientific Research (2 x 3 hr workshops) ○ Science and Society (2 x 3 hr workshops) 			
The course is designed to provide postgraduate students involved in laboratory-based research in the biological sciences with			
<ul style="list-style-type: none"> ○ the analytical and statistical skills to generate meaningful results from experimental data ○ information on how to patent and commercialise research outcomes ○ an understanding of the ethical and professional obligations of scientific research ○ an awareness of the broader social impact of scientific research and the ability to articulate and discuss this aspect of their work 			
Indicative Learning Outcomes			
On completion, students should be able to:			
<i>Data Analysis:</i> Discriminate between types of data generated in different experimental systems; produce and interpret data summaries; determine when the data generated by an experimental series is sufficient to answer the experimental question; understand what type of statistical analysis is appropriate to different data sets; analyse experimental datasets for differences and associations between groups.			
<i>Commercialisation and Patenting of Research:</i> Understand the structure of patent databases and how to use them; understand core principles of the EU Biotechnology Directive, be able to explain the steps from invention disclosure to granting of a patent, identify the criteria that an industrial partner uses when evaluating possible collaboration / licensing opportunities			
<i>Integrity in Scientific Research:</i> Understand ethical issues and obligations relating to access to confidential information obtained in a professional capacity; be familiar with the obligations involved in collaboration with industrial collaborators and sponsors, understand the need for high levels of integrity and transparency in interpreting research results, understand the criteria that are used for determining authorship of research publications			
<i>Science and Society:</i> Address and discuss the role of science in society in the context of current issues of social concern.			
Workload:	100		
Seminars	30		
Specified activities	40		
Autonomous Student learning	30		
Assessment:			
	Type	%	timing
Data Analysis Exercises	Continual Assessment	40%	
Invention Disclosure & Patent search Exercise	Submitted work	20%	Semester 3
Integrity in Science Exercise	Submitted work	20%	
Science & Society Exercise	Submitted work	20%	

Specified Activities:

- Specific exercises for each session are submitted for evaluation (40)

Assessment:

- Data analysis workshops will be assessed on a continual, session-by-session basis
- Assessment of the Commercialising and Patenting of Research workshops will involve completion of an invention disclosure form and carrying out a patent search
- For assessment of the Integrity in Scientific Research sessions, each student will be required to submit a separate one-page dramatic story-board outline of a potentially ethically-compromising scenario for a life-sciences researcher working in academia or industry
- For assessment of the Science & Society workshops, students will identify an issue that is of public concern and draft an outline presentation designed to inform (a) relevant policy makers and (b) a relevant lobbying group of the scientific aspects of the issue.