

**PROJ S8008: Ethical Project Design and Statistics.**

Module Details	
Module Code:	PROJ S8008
Full Title:	Ethical Project Design and Statistics. APPROVED
Valid From::	Semester 1 - 2018/19 ( September 2018 )
Language of Instruction:	English
Duration:	1 Semester
Credits::	5
Module Owner::	Sinead Loughran
Departments:	Unknown
Module Description:	<p>The aims of this module are:</p> <ul style="list-style-type: none"><li>- To increase student awareness of research design and the main ethical issues associated with modern research.</li><li>- To stimulate discussion on ethical issues.</li><li>- To enable the student to apply statistical principles to the design of experiments and to perform statistical analysis of experimental data.</li></ul>

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Describe, discuss and evaluate a range of methods employed in the design of experiments and the analysis of experimental data.
MLO2	Describe and critically analyse the main ethical issues associated with current and future developments in biotechnology, medical research and/or environmental research.
MLO3	Articulate and argue their personal, informed viewpoints on research-related ethical issues.
MLO4	Discuss and evaluate the importance and relevance of intellectual property (IP) within a scientific context.
MLO5	Perform, construct and evaluate statistical tests and confidence intervals commonly used in the analysis of experimental data.
Pre-requisite learning	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	

Module Indicative Content
Values, beliefs and virtues used in applying ethical and regulatory frameworks; the application of national and international legislation, agreements conventions and guidelines; decision making and whistle blowing. n/a
Design of laboratory experiments and clinical trials. Evaluation of reliability and validity; data storage, statistical analysis and confidentiality of results. n/a
International and national ethical and regulatory frameworks and their relevance. n/a
Intellectual Property (IP): Differences between artistic (copyright) and industrial property (inc. trademarks, patents, etc.). Overview of the importance and application of industrial property in the area of Biopharmaceutical Science. n/a
Experimental designs including applications to process improvement. n/a
Data Protection n/a
Project planning tools (e.g. MS project, Gantt charts). n/a
Simple comparative experiments. n/a
The ANOVA model n/a
Randomisation, blocking, replication and comparison n/a
One factor at a time versus multi-factor experiments. n/a
Factorial designs and statistical interactions. n/a

Module Assessment	
Assessment Breakdown	%
Course Work	25.00%
Project	75.00%

Module Special Regulation

## Assessments

### Full Time On Campus

Course Work			
Assessment Type	Other	% of Total Mark	25
Marks Out Of	100	Pass Mark	40
Timing	End-of-Semester	Learning Outcome	1,5
Duration in minutes	90		
<b>Assessment Description</b> Students will perform two computer laboratory based tests to assess their knowledge of experimental design and their ability to analyse experimental data. Use of the statistics package Minitab will be an integral part of both tests.			

Project			
Assessment Type	Group Project	% of Total Mark	75
Marks Out Of	0	Pass Mark	0
Timing	S1 Week 8	Learning Outcome	2,3,4
Duration in minutes	0		
<b>Assessment Description</b> Students will be divided into groups (3-5 students) and write a research proposal and/or case study to be explained and presented orally to a 'mock' Research Ethics Committee. The study will involve current research methodologies and ethical issues (and statistical analysis methods where appropriate). Marks will be allocated for the written report, the presentation, keeping a (group) journal and a questions and answers session.			

No Practical
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No Final Examination
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Reassessment Requirement
<b>No repeat examination</b> <i>Reassessment of this module will be offered solely on the basis of coursework and a repeat examination will not be offered.</i>

## Module Workload

### Workload: Full Time On Campus

Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	No Description	Every Week	1.00	1
Tutorial	Contact	No Description	Every Week	2.00	2
Directed Reading	Non Contact	No Description	Every Week	1.00	1
Practical	Contact	No Description	Every Week	2.00	2
Independent Study	Non Contact	No Description	Every Week	3.00	3
				Total Weekly Learner Workload	9.00
				Total Weekly Contact Hours	5.00

This module has no Part Time On Campus workload.

## Module Resources

### Recommended Book Resources

Dawson, C.. (2009), Introduction to research methods: A practical guide for anyone undertaking a research project, 4th ed.. How To Books Ltd..

Madden, D. (2011), Medicine, Ethics and the Law, 2nd. Bloomsbury Professional, Dublin, Ireland.

Mullins, E.. (2003), Statistics for the quality control chemistry laboratory, Royal Society of Chemistry.

Denscombe, M.. (2010), The good research guide, 4th ed.. Open University Press.

Beauchamp, T. L. and Childress, J. F.. (2002), Principles of medical bioethics, 5th. Oxford University Press..

Blaxter, L., Hughes, C. and Tight, M.. (2010), How to research, 4th ed.. Open University Press.

Goddard, W. and Melville, S.. (2007), Research methodology: An introduction, 2nd ed.. McGraw-Hill.

Box, G.E.P., Hunter, W.G. and Hunter, J.S.. (2005), Statistics for experimenters, John Wiley & Sons.

Helsel, Dennis. R. and Robert M. Hirsch. (2002), Statistical Methods in Water Resources, Techniques of Water Resources Investigations, Book 4. A3, USGS.

### Recommended Article/Paper Resources

David Colquhoun. (2014), The Perils of p-values - Why more discoveries are false than you thought., Royal Society Open Science, 19th November 2014, <http://rsos.royalsocietypublishing.org/content/1/3/140216>

### Other Resources

Website, Bioethics at the Council of Europe,  
<https://www.coe.int/en/web/bioethics>

Website, Data protection commissioner,  
<http://www.dataprotection.ie>

Website, Health and Safety Authority,  
<http://www.hsa.ie>

Website, National Research Ethics Service,  
<http://www.nres.nhs.uk/>

Website, Nuffield Council on Bioethics,  
<http://www.nuffieldbioethics.org/>

Website, Wellcome Trust,  
<http://www.wellcome.ac.uk/>

Website, StatSoft electronic statistics textbook,  
<http://www.statsoft.com/textbook/>

Website, Minitab: Software for Quality Improvement.,  
<http://www.minitab.com/en-IE/default.asp> x

Website, Bioethics web.,  
<http://www.intute.ac.uk/healthandlifesciences/bioethicsweb/>

Website, National Advisory Committee on Bioethics,  
<http://health.gov.ie/national-advisory-committee-on-bioethics/>

Website, Stats Resources,  
<https://www.openintro.org/>

Website, Stats Resources,  
<http://stattrek.com/experiments/experimental-design.aspx>

Website, Stats Resources,  
<http://www.stats.gla.ac.uk/steps/glossary/anova.html>

Website, Stats Resources,  
<https://newonlinecourses.science.psu.edu/stat502/node/1/>

Website, Minitab,  
<https://minitab.com/en-us/>

Website, ANOVA,  
<http://faculty.webster.edu/woolfm/anova.html>