

University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Regression Methods and Experimental Design			
Code: MATH10008	SCQF Level: 10 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Dr Raymond Carragher		
Summary of Module			
<p>This module aims to prepare the participant to design and conduct research and statistically analyse research output. The emphasis of the module will be the understanding of the concepts of research hypotheses and their application on research design and research output analysis.</p> <p>Concepts from linear single regression modelling are reviewed and extended to include topics such as multiple linear regression, and one- and two-way ANOVA.</p> <p>Experimental design methods and topics are discussed for categorical data.</p> <p>Logistic linear regression analysis is also introduced.</p> <p>Participants are given the opportunity to demonstrate their knowledge of these concepts by creating research questions and applying suitable analytical procedures on the research output.</p> <p>Suitable statistical package(s) are used to demonstrate understanding of the experimental design and modelling concepts.</p> <p>The Graduate Attributes relevant to this module are given below:</p> <ul style="list-style-type: none"> • Academic: Critical thinker; Analytical; Inquiring; Knowledgeable; Problem-solver; Digitally literate; Autonomous . • Personal: Effective communicator; Resilient • Professional: Collaborative; Research-minded; Socially responsible; Ambitious; Driven. 			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See Guidance Note for details.

Campus(es) for Module Delivery

The module will **normally** be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)

Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Add name

Term(s) for Module Delivery

(Provided viable student numbers permit).

Term 1	<input checked="" type="checkbox"/>	Term 2	<input type="checkbox"/>	Term 3	<input type="checkbox"/>
--------	-------------------------------------	--------	--------------------------	--------	--------------------------

Learning Outcomes: (maximum of 5 statements)

These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module.

At the end of this module the student will be able to:

L1	Formulate suitable research hypotheses for a statistical test.
L2	Create a suitable experimental design and build a suitable corresponding model.
L3	Analyse and interpret output from the test.
L4	Use suitable computer software to perform and present appropriate analyses.

Employability Skills and Personal Development Planning (PDP) Skills

SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p>SCQF Level 10</p> <p>Demonstrating a knowledge and understanding of concept of experimental design and linear regression modelling.</p> <p>Demonstrating awareness of the application of statistical hypothesis, as appropriate, to the solution of problems.</p>
Practice: Applied Knowledge and Understanding	<p>SCQF Level 10</p> <p>Using a range of standard techniques of decision making and statistical model building as well as the application of the hypothesis in research to solve standard statistical problems, as appropriate, and making valid interpretations of these.</p>

Generic Cognitive skills	SCQF Level 10 Using a range of methods to analyse well-defined problems in relevant statistical contexts.	
Communication, ICT and Numeracy Skills	SCQF Level 10 Conceptualising and analysing problems informed by professional and research issues. Using suitable software to obtain, present and make valid interpretation of statistical problems and results, as appropriate.	
Autonomy, Accountability and Working with others	SCQF Level 10 Working autonomously to produce short reports on statistical problems. Collaborating with others in a small team to solve statistical problems.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code: MATH09012	Module Title: Statistical Estimation and Inference
	Other:	or equivalent
Co-requisites	Module Code:	Module Title:

*Indicates that module descriptor is not published.

Learning and Teaching	
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	24
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	12

Independent Study	152
	200 Hours Total
**Indicative Resources: (eg. Core text, journals, internet access)	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <p>"Regression Methods and Experimental Design" class notes on the University VLE.</p> <p>Suitable software, e.g. R and Word.</p> <p>"Regression Modeling Strategies", FE Harrell jr.</p>	
<p>(*N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)</p>	
Attendance and Engagement Requirements	
<p>In line with the Student Attendance and Engagement Procedure: Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.</p>	

Equality and Diversity	
<p>The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.</p>	
<p>(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)</p>	

Supplemental Information

Divisional Programme Board	Engineering and Physical Sciences
Assessment Results (Pass/Fail)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
School Assessment Board	Computing, Engineering and Physical Sciences

Moderator	Dr Alan Walker
External Examiner	P Wilson
Accreditation Details	
Changes/Version Number	1.09 Updated module summary and term change. Slight change to component category. Moderator changed.

Assessment: (also refer to Assessment Outcomes Grids below)
Assessment 1 – Coursework worth 20% of the final mark. This will involve appropriate statistical analyses and use suitable software.
Assessment 2 – Adapted Assessment (Online open book) (80%)
(N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Assessment Outcome Grids (See Guidance Note)

Component 1							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetable Contact Hours
Unseen open book (standard)	✓	✓	✓			80	2

Component 2							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetable Contact Hours
Coursework				✓		20	

Combined Total for All Components	100%	2 hours
--	-------------	----------------