



Module Descriptor

Title	Regression Methods and Experimental Design		
Session	2025/26	Status	Published
Code	MATH10008	SCQF Level	10
Credit Points	20	ECTS (European Credit Transfer Scheme)	10
School	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	On-Campus¹ <input checked="" type="checkbox"/>	Hybrid² <input type="checkbox"/>	Online³ <input type="checkbox"/>	Work -Based Learning⁴ <input type="checkbox"/>
Campuses for Module Delivery	<input type="checkbox"/> Ayr <input type="checkbox"/> Dumfries	<input type="checkbox"/> Lanarkshire <input type="checkbox"/> London <input checked="" type="checkbox"/> Paisley	<input type="checkbox"/> Online / Distance Learning <input type="checkbox"/> Other (specify)	
Terms for Module Delivery	Term 1 <input checked="" type="checkbox"/>	Term 2 <input type="checkbox"/>	Term 3 <input type="checkbox"/>	
Long-thin Delivery over more than one Term	Term 1 – Term 2 <input type="checkbox"/>	Term 2 – Term 3 <input type="checkbox"/>	Term 3 – Term 1 <input type="checkbox"/>	

Learning Outcomes	
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.
L5	

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)	SCQF 10 Demonstrating a knowledge and understanding of concept of experimental design and linear regression modelling. Demonstrating awareness of the application of statistical hypothesis, as appropriate, to the solution of problems.
Practice: Applied Knowledge and Understanding	SCQF 10 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.
Generic Cognitive skills	SCQF 10

¹ Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

² The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

³ Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

⁴ Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

	Using a range of methods to analyse well-defined problems in relevant statistical contexts.
Communication, ICT and Numeracy Skills	<p>SCQF 10</p> <p>Conceptualising and analysing problems informed by professional and research issues.</p> <p>Using suitable software to obtain, present and make valid interpretation of statistical problems and results, as appropriate.</p>
Autonomy, Accountability and Working with Others	<p>SCQF 10</p> <p>Working autonomously to produce short reports on statistical problems.</p> <p>Collaborating with others in a small team to solve statistical problems.</p>

Prerequisites	Module Code MATH09012	Module Title Statistical Estimation and Inference
	Other Or equivalent	
Co-requisites	Module Code	Module Title

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.	
<p>Learning Activities</p> <p>During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p>Student Learning Hours</p> <p>(Note: Learning hours include both contact hours and hours spent on other learning activities)</p>
Lecture / Core Content Delivery	24
Tutorial / Synchronous Support Activity	12
Tutorial / Synchronous Support Activity	12
Independent Study	152
Please select	
Please select	
TOTAL	200

Indicative Resources
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <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>

"Regression Modeling Strategies", FE Harrell jr.

(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)

Attendance and Engagement Requirements

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.

For the purposes of this module, academic engagement equates to the following:

The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations.

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	Engineering Physical Sciences
Overall Assessment Results	<input type="checkbox"/> Pass / Fail <input checked="" type="checkbox"/> Graded
Module Eligible for Compensation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.
School Assessment Board	Computing, Engineering and Physical Sciences
Moderator	Dr Alan Walker
External Examiner	P Wilson
Accreditation Details	

Module Appears in CPD catalogue	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Changes / Version Number	

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Coursework(s) worth 20% of the final mark. This will involve appropriate statistical analyses and use suitable software.
Assessment 2
Class Test (Unseen, closed book) (80%)
Assessment 3
(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.)

Component 1							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Class test (unseen closed book)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	80	2

Component 2							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Coursework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20	

Component 3							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Combined total for all components						100%	2 hours

Change Control

What	When	Who
Assessment 1 has been changed to Class Test (Unseen, closed book)	March 2025	Raymond Carragher
