

University of the West of Scotland
Module Descriptor

Session: 2023/24

Title of Module: Probability and Statistics			
Code: MATH08010	SCQF Level: 8 (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:	TBC		
Summary of Module			
<p>This module extends the ideas in basic statistics and probability from Analysis of Data (MATH07001) to a study of more advanced probability concepts. Having consolidated an understanding the concept of probability, the emphasis will be on extending that understanding in a study of discrete and continuous random variables and probability distributions. A range of commonly occurring discrete probability distributions will be discussed including binomial, Poisson, geometric and hypergeometric distributions. Additionally, a range of commonly occurring continuous probability distributions will be discussed including uniform, exponential, and normal distributions. The importance of the normal distribution will be discussed in detail, including reference to such topics as the central limit theorem. The ideas of measuring average and variability in MATH07001 will be extended to the concepts of expectation and variance of a random variable. Moments of a random variable will be discussed.</p> <p>The ideas of sampling distributions, confidence limits and intervals will be introduced. Suitable statistical software package(s) will be used for visual understanding of the concepts, calculations and predictions.</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; Motivated, Creative; Resilient/ • Professional: Collaborative; Research-minded; Socially responsible; Ambitious; Driven. 			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
✓					
<p>Face-To-Face Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.</p> <p>Blended A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered "blended" if it includes a combination of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations</p> <p>Fully Online Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.</p> <p>HybridC Online with mandatory face-to-face learning on Campus</p>					

HybridO

Online with optional face-to-face learning on Campus

Work-based Learning

Learning activities where the main location for the learning experience is in the workplace.

Campus(es) for Module DeliveryThe module will **normally** be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit)

Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
✓						

Term(s) for Module Delivery

(Provided viable student numbers permit).

Term 1		Term 2		Term 3	
	✓				

Learning Outcomes: (maximum of 5 statements)

On successful completion of this module the student will be able to:

- L1. Implement suitable analytic procedures in problems involving discrete random variables and probability distributions.
- L2. Implement suitable analytic procedures in problems involving continuous random variables and probability distributions.
- L3. Demonstrate an understanding of sampling distributions, and use standard analytic techniques to estimate confidence limits/intervals.
- L4. Use suitable software to perform statistical analysis and interpret its output.

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 Level 8. Demonstrating a knowledge and understanding of the concept of a probability distribution and resulting calculations. Demonstrating basic awareness of the application of statistical techniques, as appropriate, to the solution of problems.
Practice: Applied Knowledge and Understanding	SCQF Level 8. Using a range of standard techniques of calculation in solving standard problems in statistics and probability, and making valid interpretations of these.
Generic Cognitive skills	SCQF Level 8. Using a range of methods to analyse well-defined problems in relevant mathematical or statistical contexts.
Communication, ICT and Numeracy Skills	SCQF Level 8. Using suitable software to obtain and present results to statistical problems, as appropriate.

Autonomy, Accountability and Working with others	SCQF Level 8. Working autonomously and with others to solve and produce short reports on statistical problems. Conceptualising and analysing problems informed by professional and research issues.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code: MATH07001	Module Title: Analysis of Data
	Other:	or equivalent
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

Learning and Teaching	
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: Statistical software, e.g. Excel, SPSS, R.</p> <p>Generic software, e.g. Microsoft Word.</p> <p>"Probability and Statistics" class notes as published on the University VLE.</p> <p>"Introduction to Probability, Statistics and Random Processes", H Pishro-Nik</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)	
Engagement Requirements	

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: [Academic engagement procedure](#)

Supplemental Information

Programme Board	Physical Sciences
Assessment Results (Pass/Fail)	No
Subject Panel	Physical Sciences
Moderator	Alan Walker
External Examiner	P Wilson
Accreditation Details	
Changes/Version Number	1.06 Module coordinator tbc, small change in hours breakdown Changed delivery mode to "face-to-face" for new AY Updated the title of another module referred to in the descriptor.

Assessment: (also refer to Assessment Outcomes Grids below)

Coursework worth 50% of the final mark. This will involve appropriate statistical analyses and uses suitable software.

Unseen examination worth 50% of the final mark.

(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 Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1						
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Unseen closed book (standard)	✓	✓	✓		50	2
Component 2						
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Weighting (%) of Assessment Element	Timetabled Contact Hours

Class test (practical)				✓	50	5
Combined Total For All Components					100%	7 hours

Footnotes

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

Note(s):

1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note).
This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

Equality and Diversity

The module is suitable for any student satisfying the pre-requisites.

[UWS Equality and Diversity Policy](#)

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