

H7QMF3: Quantitative Methods in Finance

Module Code:	H7QMF3
Long Title	Quantitative Methods in Finance APPROVED
Title	Quantitative Methods in Finance
Module Level:	LEVEL 7
EQF Level:	6
EHEA Level:	First Cycle
Credits:	5
Module Coordinator:	CORINA SHEERIN
Module Author:	CORINA SHEERIN
Departments:	School of Business
Specifications of the qualifications and experience required of staff	
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Demonstrate a practical knowledge of the principles of statistical inference and apply this knowledge in developing conclusions about populations based on sample results within an accounting and financial context.
LO2	Synthesise data and analyse financial and accounting problems under conditions of uncertainty, formulate null and alternative hypotheses and exercise judgement in the resolution of business problems using hypothesis testing.
LO3	Interpret relationships between two or more financial, economic and/or accounting variables through the use of correlation and regression analysis.
LO4	Use appropriate software in the application and interpretation of statistical methods and techniques and present findings/output in a technical and technical or non-technical manner as required.
Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	Programme entry requirements

H7QMF3: Quantitative Methods in Finance

Module Content & Assessment			
Indicative Content			
Review of Descriptive Statistics (Week 1) n/a			
Inferential Statistics (Week 2 - 3) • Probability Distributions: Applications to Asset Returns • Brief review of probability concepts and rules • Discrete and continuous random variables • Expected value and variance of a discrete random variable • Application of discrete random variables: calculating the returns and standard deviation of a portfolio Sample Application of Content: Using probability trees to model a financial problem e.g.: the direction of changes in a stock's quarterly EPS given four possible scenarios, hence calculate conditional probabilities as additional information is revealed.			
Hypothesis Testing (Week 3 - 4) • Introduction to Hypothesis Testing • Hypothesis Testing Procedures • One Sample Tests of Hypothesis Software: Using excel and/or MATLAB to carry out hypothesis tests Sample Application of Content: Selecting from a range of hypothesis tests to check the validity of a statement(s) about a population parameter such as the average return on a managed portfolio(s).			
Hypothesis Testing: Two Sample Tests of Hypothesis (Week 5- 6, 8-9) • Two Samples Tests of Hypothesis: Independent Samples • Comparing Population Means with Unknown Population Standard Deviations (Pooled T Tests) • Comparing Population Means with Unknown Population Standard Deviations (Unequal) • Two Sample Tests of Hypothesis: Dependent Samples • Introduction to the F Distribution • Comparing Population Variances Software: Using excel and/or MATLAB to carry out hypothesis tests Sample Application of Content: Selecting from a range of hypothesis tests to check the validity of an investment statement(s) about a population parameter. For example candidates may be provided with a data set concerning two managed funds A and B who are similar in terms of overall risk and asked to test whether there is a difference in their average performance over a given time period.			
Correlation & Regression (Week 10 -12) • Correlation & Covariance Coefficient • Coefficient of Determination • Testing the Significance of the Correlation Coefficient • Introduction to Regression Analysis • Linear Regression: Principles of Ordinary Least Squares Technique (OLS) • Assumptions underlying Linear Regression • Using Regression for Predictions Software: Using excel to test for relationships between variables using graphics, correlation and hence regression analysis. Sample Application of Content: Exploring the relationship between money supply growth and inflation and hence estimating the strength of the relationship, testing for spurious correlations and using the regression equation in prediction.			
Revision (Week 12) n/a			
Assessment Breakdown			%
Coursework			40.00%
End of Module Assessment			60.00%
Assessments			
Full Time			
Coursework			
Assessment Type:	Continuous Assessment	% of total:	40
Assessment Date:	n/a	Outcome addressed:	1,2
Non-Marked:	No		
Assessment Description: Learners will be provided with a financial dataset and/or case study. Learners will be expected to undertake a number of prescribed tests on the data. A number of questions will be presented to the learner and they will be expected to evaluate, combine and synthesise the information and develop and present a detailed technical report of the findings.			
End of Module Assessment			
Assessment Type:	Terminal Exam	% of total:	60
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3,4
Non-Marked:	No		
Assessment Description: The examination will be a minimum of two hours in duration and may include a mix of: short or long problem-based questions, vignettes, essay-based questions and case study-based questions. All questions will be marked according to clarity, structure and depth of knowledge.			
No Workplace Assessment			
Reassessment Requirement			
Repeat examination <i>Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.</i>			
Reassessment Description Candidates will attempt the repeat assessment for the module, if they do not successfully pass the module. Learners are required to attempt all assessments attaching to a module. For those modules where all learning outcomes are assessable with a final examination, the student does not have to re-sit failed individual CA components.			

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Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom and demonstrations	2	Every Week	2.00
Lecturer Supervised Learning	Mentoring and small-group tutoring	1	Every Week	1.00
Directed Learning	Directed e-learning	3	Every Week	3.00
Independent Learning	Independent learning	8	Every Week	8.00
Total Weekly Contact Hours				6.00

Module Resources	
<i>Recommended Book Resources</i>	
Lind D.A., Marchal W.G., and Wathen S.A. (2021), <i>Statistical Techniques in Business and Economics</i>, 18th International Ed. McGraw Hill. Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D. and Cochran, J.J. (2020), <i>Modern Business Statistics with Microsoft Excel</i>, Cengage Learning.	
<i>Supplementary Book Resources</i>	
Moore, D.S., McCabe, G.P., Craig, B. (2021), <i>Introduction to the Practice of Statistics</i>, 10th Ed. Macmillan Education. Caldwell, S. (2013), <i>Statistics Unplugged</i>, 4th Ed. Cengage Learning. Triola, M.F. (2019), <i>Essentials of Statistics</i>, 6th Ed. Pearson Education.	
<i>This module does not have any article/paper resources</i>	
<i>Other Resources</i>	
[Website], Dr Corina Sheerin – Quants Support (You Tube Private Channel- links provided in class for each topic). [Website], NCI Mathematics Support Videos- Maths and Stats Maths and Stats - YouTube. [Website], http://epp.eurostat.ec.europa.eu/. [Website], www.bloomberg.com. [Website], www.reuters.com. [Website], www.cso.ie. [Website], www.ft.com. [Website], www.wsj.com. [Website], www.economist.com. [Website], www.federalreserve.com. [Website], www.esri.ie. [Website], www.imf.org. [Website], www.cso.ie.	
Discussion Note:	