

H6STATS1: Statistics I

Module Code:	H6STATS1
Long Title	Statistics I APPROVED
Title	Statistics I
Module Level:	LEVEL 6
EQF Level:	5
EHEA Level:	Short Cycle
Credits:	10
Module Coordinator:	EUGENE O'LOUGHLIN
Module Author:	EUGENE O'LOUGHLIN
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	Master's degree in a computing or cognate discipline. May have industry experience also.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Evaluate and choose between different options for inference statistics so that a motivated decision between two or more options can be made
LO2	Develop a strategy for a statistical analysis when presented with a real- world problem from business
LO3	Apply methodologies used in prediction and interpret the results
LO4	Use and compare software tools for business data analysis (e.g. SPSS, R, Excel, SAS)
LO5	Critically evaluate statistical applications in a particular discipline
Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	See section 4.2 Entry procedures and criteria for the programme including procedures recognition of prior learning

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Module Content & Assessment			
Indicative Content			
Descriptive Statistics (Describing and Charting Data Sets) Ethics Arrangement, pre-processing and representation of data. Measures of central tendency (mode, median, mean) . Measures of dispersion (range, variance, standard deviation) . Statistical graphics & visuals (e.g., box-plot, histograms). Ethics implications and Statistics.			
Introduction to Probability Sample points, sample space, events. Calculating probabilities. Venn diagrams. Combinatorial mathematics			
Hypothesis Testing Null/Alternative Hypothesis. Single sample z test. One-tail tests. Two-tail tests			
Test for Normality Normal distributions . Q-Q/P-P Plots. Shapiro-Wilk Test. Kolmogorov-Smirnov Test			
Independent Samples Test Test for Equality of Variance. Student's t-Test (independent samples)			
Dependent Samples Test Student's t-Test (Dependent samples)			
One-Way Analysis of Variance (ANOVA) One-way ANOVA. Post Hoc tests			
Non-parametric tests Mann-Whitney Test. Wilcoxon Sign-Rank Test			
Non-parametric tests Kruskal-Wallis Test. Chi squared (χ^2) test for independence			
Reporting Sample size. Confidence intervals. Effect size. Power			
Correlation Linear Regression Pearson's correlation coefficient. Scatter Diagrams. Prediction. Simple Linear Regression. Multiple Linear Regression			
Revision Revision			
Assessment Breakdown			%
Coursework			100.00%
Assessments			
Full Time			
Coursework			
Assessment Type:	Continuous Assessment	% of total:	Non-Marked
Assessment Date:	n/a	Outcome addressed:	1,2,3,4,5
Non-Marked:	Yes		
Assessment Description: Formative assessment will be included by the provision of exercises and short answer questions during weekly tutorials. Feedback will be provided individually or as a group in written and/or oral format, or on-line through Moodle. In addition, in class discussions will be undertaken as part of the practical approach to learning. Learners will be encouraged to share exercises for peer review – in particular for data visualisations.			
Assessment Type:	Continuous Assessment	% of total:	50
Assessment Date:	n/a	Outcome addressed:	1,2,3,5
Non-Marked:	No		
Assessment Description: The first test will assess learners' knowledge and understanding of setting null and alternative hypotheses for single sample and two sample statistical tests. Learners will also be required in the test to calculate test statistics (z and t), and to report on results. A sample question, marking scheme, and solution, is provided below.			
Assessment Type:	Continuous Assessment	% of total:	50
Assessment Date:	n/a	Outcome addressed:	3,4,5
Non-Marked:	No		
Assessment Description: The second test (lab-based) will assess learners' knowledge and understanding of specific statistical tests (e.g., ANOVA, Chi-Square, Mann-Whitney, Kruskal-Wallis). A sample question, marking scheme, and solution, is provided below.			
No End of Module Assessment			
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 The repeat strategy for this module is an examination. Learners will be afforded an opportunity to repeat the examination at specified times throughout the year and all learning outcomes will be assessed in the repeat exam.			

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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 & Demonstrations (hours)	24	Per Semester	2.00
Tutorial	Other hours (Practical/Tutorial)	36	Per Semester	3.00
Independent Learning	Independent learning (hours)	190	Per Semester	15.83
Total Weekly Contact Hours				5.00

Module Resources	
<i>Recommended Book Resources</i>	
Neil J. Salkind. (2014), <i>Statistics for People Who (Think They) Hate Statistics</i> (4th ed), Sage Publications, Inc Thousand Oaks. Cortinhas, C. & Black, K.. (2012), <i>Statistics for Business and Economics</i>, John Wiley & Sons. McClave, J & Sincich, T.. (2012), <i>Statistics</i> (12th ed), Pearson.	
<i>Supplementary Book Resources</i>	
Field, A.. (2013), <i>Discovering Statistics Using IBM SPSS Statistics</i> (4th ed), Sage Publications Inc London. McClave, James T., Benson, G., & Sincich, T.. (2013), <i>Statistics for Business and Economics</i> (12th ed), Prentice Hall. Coolidge, F. L.. (2012), <i>Statistics</i> (3rd ed), Sage Publications. Winston, L. W.. (2014), <i>Microsoft Excel</i>. Urduan, T. C.. (2016), <i>Statistics in Plain English</i> (4th ed), Routledge.	
<i>This module does not have any article/paper resources</i>	
<i>Other Resources</i>	
[Website], https://www.bloomberg.com/europe [Website], https://uk.finance.yahoo.com [Website], https://www.google.com/finance [Website], http://www.cso.ie [Website], http://ec.europa.eu/eurostat [Website], https://www.data.gov [Website], https://aws.amazon.com/datasets [Website], https://datamarket.com [Website], http://www.pewresearch.org/data [Website], http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html [Website], https://fred.stlouisfed.org	
Discussion Note:	