

## H9RTM: Research Methods

Module Code:	H9RTM
Long Title	Research Methods <b>APPROVED</b>
Title	Research Methods
Module Level:	LEVEL 9
EQF Level:	7
EHEA Level:	Second Cycle
Credits:	5
Module Coordinator:	ARLENE EGAN
Module Author:	ARLENE EGAN
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner will be able to:</i>	
<b>#</b>	<b>Learning Outcome Description</b>
LO1	Critically investigate quantitative data and research methods as applied in the computing technology field.
LO2	Demonstrate comprehensive knowledge of how to solve problems of quantitative analysis that focus on core statistical concepts (which include; stating hypotheses, sampling, distribution, significance)
LO3	Critically evaluate experimental research and literature published in the field of computing technology
LO4	Demonstrate competence and skills in the use of statistical tools and the ability to critically assess outputs and levels of significance.
LO5	Employ enhanced project management and collaboration skills.
<b>Dependencies</b>	
<b>Module Recommendations</b>	
No recommendations listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Entry requirements</b>	

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Module Content & Assessment			
Indicative Content			
<b>Introduction (5%)</b> • Characteristics of data and data types • Revision of research cycles			
<b>Hypothesis testing, power and effect size (15%)</b> • Probability • Hypothesis testing • Confidence intervals • P values/significance level • Type 1 and Type 2 errors • Effect size • Influencing the power of a test • Calculating power • Sample size • Assumptions of quantification			
<b>Data collection and Quantitative tests (25%)</b> • Quantitative data collection; surveys, observations; log data • T-tests; rationale, assumptions and applications • Correlations; • One-way repeated measures • Regression analysis • Non-parametric analysis: Chi-square, Mann Whitney U test, Wilcoxon signed ranks test, Friedman's test, Kruskal-Wallis • Non parametric correlations			
<b>Practical application (15%)</b> • Calculating descriptive statistics • Calculating probabilities, standard error and confidence intervals • Using tools to carry out statistical tests (e.g., t-tests, ANOVAs, regression) • Reporting interpretations and assumptions of those tests			
<b>Project Management (20%)</b> Project definition and phases • Activities, milestones (code development) and deliverables (chapters/sections of documents) • Public code repositories, change management, and versioning • Project supervisor engagement and communication			
<b>Communication and collaboration (20%)</b> • Oral, team and electronic group communication • Visualisation techniques and application (e.g., trees, graphs, networks) • Employing tools such as project management software and other virtual learning facilities and tools (e.g. WBS, gantt charts, process and progress plans) • Peer-to-peer problem-based learning and evaluation • Visual Information Processing			
Assessment Breakdown			%
Coursework			100.00%
<b>Assessments</b>			
Full Time			
Coursework			
<b>Assessment Type:</b>	Assignment	<b>% of total:</b>	60
<b>Assessment Date:</b>	n/a	<b>Outcome addressed:</b>	1,2,3,4
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> In-class test on statistical concepts, techniques and procedures.			
<b>Assessment Type:</b>	Project	<b>% of total:</b>	40
<b>Assessment Date:</b>	n/a	<b>Outcome addressed:</b>	1,2,3,4,5
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> Team project to analyse the data and to draw conclusions on a case-study.			
No End of Module Assessment			
No Workplace Assessment			
Reassessment Requirement			
<b>Repeat examination</b> <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>			

## H9RTM: Research Methods

Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	per week	1	Every Week	1.00
Tutorial	per week	1	Every Week	1.00
Independent Learning Time	No Description	8.5	Once per semester	0.71
Total Weekly Contact Hours				2.00
Workload: Part Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	per week	1	Every Week	1.00
Tutorial	per week	1	Every Week	1.00
Independent Learning Time	No Description	8.5	Once per semester	0.71
Total Weekly Contact Hours				2.00

Module Resources	
<i>Recommended Book Resources</i>	
<p>Giudici, P., Ingrassia, S., &amp; Vichi, M.. (2013), Statistical Models for Data Analysis, Springer, London.</p> <p>Marder, M.P.. (2011), Research Methods for Science, Cambridge University Press.</p>	
<i>Supplementary Book Resources</i>	
<p>Demir, F., Karakaya, M., &amp; Tosun, H. (2012), Research Methods in Usability and Interaction design: Evaluations and case studies., Lambert Academic Press.</p> <p>Muata, K., Bryson, O., &amp; Ngwenyama, O.. (2014), Advances in Research for information Systems Research: Data mining, data envelopment, value focused thinking, Springer, London.</p> <p>George, D. And Mallery, P.. (2011), SPSS for Windows Step by Step: A Simple Study Guide, 10th. Allyn &amp; Bacon, UK.</p> <p>Goodman, E., Kuniavsky, M., &amp; Moed A.. (2012), A Practitioners Guide to User Research:, MA: Elsevier.</p> <p>Grbich, C.. (2013), Qualitative Data Analysis: An Introduction, Sage, London.</p> <p>Vittingoff, E., Glidden, D.V., Shiboshi, S.C. &amp; McCulloch, C.E.. (2012), Regression Methods in Biostatistics: Linear, logistic, survival and repeated measures models, Springer, London.</p>	
<i>This module does not have any article/paper resources</i>	
<i>Other Resources</i>	
<p>[website], The Research Methods Knowledge Base,  <a href="http://http://www.socialresearchmethods.net/kb/">http://http://www.socialresearchmethods.net/kb/</a></p> <p>[website], Research Randomizer,  <a href="http://www.randomizer.org/">http://www.randomizer.org/</a></p> <p>[website], Glossary of Statistical Terms,  <a href="http://www.animatedsoftware.com/elearning">http://www.animatedsoftware.com/elearning</a></p> <p>[website], HyperStat Online,  <a href="http://davidmlane.com/hyperstat/">http://davidmlane.com/hyperstat/</a></p> <p>[website], InfoVis:Wiki, the Information Visualization community platform,  <a href="http://www.infovis-wiki.net/">http://www.infovis-wiki.net/</a></p> <p>[journal], IEEE Transactions on Visualization and Computer Graphics,  <a href="http://ieeexplore.ieee.org/xpl/RecEntIssue.jsp?punumber=2945">http://ieeexplore.ieee.org/xpl/RecEntIssue.jsp?punumber=2945</a></p> <p>[website], Information Visualization - Sage,  <a href="http://www.uk.sagepub.com/journals/Journal202055">http://www.uk.sagepub.com/journals/Journal202055</a></p> <p>[website], Interaction Design Foundation – Data Visualization for Human Perception,  <a href="http://www.free-knowledge.org/encyclopedia/data_visualization_for_human_perception.html">http://www.free-knowledge.org/encyclopedia/data_visualization_for_human_perception.html</a></p>	
Discussion Note:	