H9RTM: Research Methods

Module Code:	H9RTM
Long Title	Research Methods APPROVED
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	

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
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.

Dependencies
Module Recommendations
No recommendations listed
Co-requisite Modules
No Co-requisite modules listed

Entry requirements	

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Module Content & Assessment

Indicative Content
Introduction (5%) • Characteristics of data and data types • Revision of research cycles
Hypothesis testing, power and effect size (15%) • 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
Data collection and Quantitative tests (25%) • 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, Wilcoxen signed ranks test, Friedman's test, Kruskal-Wallis • Non parametric correlations
Practical application (15%) • 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
Project Management (20%) 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
Communication and collaboration (20%) • 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%

Assessments

Full Time

Coursework

Assessment Type:	Assignment	**% of total:**	60
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4
Non-Marked:	No		

Assessment Description:
In-class test on statistical concepts, techniques and procedures.

Assessment Type:	Project	**% of total:**	40
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	No		

Assessment Description:
Team project to analyse the data and to draw conclusions on a case-study.

No End of Module Assessment

No Workplace Assessment

Reassessment Requirement

Repeat examination
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.

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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	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

Recommended Book Resources

Giudici, P., Ingrassia, S., & Vichi, M.. (2013), Statistical Models for Data Analysis, Springer, London.

Marder, M.P.. (2011), Research Methods for Science, Cambridge University Press.

Supplementary Book Resources

Demir, F., Karakaya, M., & Tosun, H. (2012), Research Methods in Usability and Interaction design: Evaluations and case studies., Lambert Academic Press.

Muata, K., Bryson, O., & Ngwenyama, O.. (2014), Advances in Research for information Systems Research: Data mining, data envelopment, value focused thinking, Springer, London.

George, D. And Mallery, P.. (2011), SPSS for Windows Step by Step: A Simple Study Guide, 10th. Allyn & Bacon, UK.

Goodman, E., Kuniavsky, M., & Moed A.. (2012), A Practitioners Guide to User Research:, MA: Elsevier.

Grbich, C.. (2013), Qualitative Data Analysis: An Introduction, Sage, London.

Vittingoff, E., Glidden, D.V., Shiboshi, S.C. & McCulloch, C.E.. (2012), Regression Methods in Biostatistcis: Linear, logistic, survival and repeated measures models, Springer, London.

This module does not have any article/paper resources

Other Resources

[website], The Research Methods Knowledge Base,
http://ttp://www.socialresearchmethods.n et/kb/

[website], Research Randomizer,
http://www.randomizer.org/

[website], Glossary of Statistical Terms,
http://www.animatedsoftware.com./elearni ng

[website], HyperStat Online,
http://davidmlane.com/hyperstat/

[website], InfoVis:Wiki, the Information Visualization community platform,
http://www.infovis-wiki.net/

[journal], IEEE Transactions on Visualization and Computer Graphics,
http://ttp://ieeexplore.ieee.org/xpl/Rec entIssue.jsp?punumber=2945

[website], Information Visualization - Sage,
http://www.uk.sagepub.com/journals/Journ al202055

[website], Interaction Design Foundation – Data Visualization for Human Perception,
http://www.free-knowledge.org/encycloped ia/data_visualization_for_human_percepti on.html

Discussion Note:	