MATH C3502: Mathematics and Statistics III

Module Title:	Mathematics and Statistics III
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	Lectures, practicals, private study

Module Aim:	The aim of the module is to develop students' ability to apply the concepts of probability and statistical analysis to civil engineering systems.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Apply appropriate probability distribution functions to examples encountered in a civil engineering context.
LO2	Complete reliability calculations for simple engineering systems.
LO3	Construct and interpret statistical quality control charts based on means and ranges.
LO4	Use regression analysis to explore relationships between variables and measure the strength of such relationships.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
Probability distributions (a) Review of Binomial, Poisson, Geometric and Hypergeometric distributions. (b) Review of Uniform, Exponential, Normal distributions and Sampling distributions. (c) Application of these discrete and continuous probability distributions to civil engineering contexts.
Reliability and quality control (a) Lifetime distributions and reliability calculations. (b) The Weibull distribution. (c) Statistical quality control. (d) Control charts based on means and ranges.
Regression and correlation (a) Review of regression and correlation concepts previously covered. (b) Evaluating the linear regression model. (c) Regression analysis in Excel. (d) Confidence intervals and prediction intervals for the mean response. (e) Transforming non-linear models. (f) Multiple linear regression.

Assessment Breakdown	%
Continuous Assessment	60.00%
Practical	40.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Class Test 1	1,2	30.00	Week 8
Examination	Class Test 2	4	15.00	Week 13
Short Answer Questions	Quiz questions	1,2,4	15.00	Ongoing

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Assessed Practical 1	3	10.00	Week 6
Practical/Skills Evaluation	Assessed Practical 2	4	30.00	Week 12

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	2.00
Practicals	12 Weeks per Stage	1.00
Estimated Learner Hours	15 Weeks per Stage	7.00
	Total Hours	141.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering	6	Mandatory