



<b>Title:</b>	Mathematics for Science 2.2 <b>APPROVED</b>
<b>Long Title:</b>	Mathematics for Science 2.2 with Maple
<b>Module Code:</b>	MATH6038
<b>Duration:</b>	1 Semester
<b>Credits:</b>	5
<b>NFQ Level:</b>	Fundamental
<b>Field of Study:</b>	Mathematics
<b>Valid From:</b>	Semester 1 - 2009/10 ( September 2009 )
<b>Module Delivered in</b>	no programmes
<b>Module Coordinator:</b>	David Goulding
<b>Module Author:</b>	MICHAEL BRENNAN
<b>Module Description:</b>	This modules involves the study of matrices, statistics and probability distributions.
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Use matrix techniques to solve systems of equations
LO2	Calculate and interpret measures of central tendency and measures of dispersion
LO3	Calculate probabilities using standard distributions
LO4	Construct and interpret quality control charts
LO5	Use the Maple package to explore and reinforce mathematical concepts
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b>	
<i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named MTU module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
<b>Incompatible Modules</b>	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b>	
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	

**Module Content & Assessment**

**Indicative Content**

**Matrix Algebra**

Matrix operations, properties of matrix operations, determinants, properties of determinants, row operations, Gaussian elimination, inverse matrices, solving linear system of equations, investigation of the solution space of linear system of equations.

**Probability and Statistics**

Presentation and analysis of data. Measures of central tendency; mean, mode and median. Measures of dispersion; range variance and standard deviation. Sample space, compound events, conditional probability, independent events, reliability block diagrams, Bayes Rule. Random variables, binomial, Poisson and Normal distributions. Introduction to sampling, confidence intervals for large and small samples. Construct and interpret quality control charts.

**Assessment Breakdown**

	%
Course Work	30.00%
End of Module Formal Examination	70.00%

**Course Work**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	One hour written exam	1,2	20.0	Week 7
Practical/Skills Evaluation	Maple Lab	5	10.0	Every Week

**End of Module Formal Examination**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End-of-Semester Final Examination	1,2,3,4	70.0	End-of-Semester

**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.

The institute reserves the right to alter the nature and timings of assessment

**Module Workload**

<b>Workload: Full Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Conventional Lecture	3.0	Every Week	3.00
Tutorial	Based on Exercise Sheets	1.0	Every Week	1.00
Lab	Laboratory	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	No Description	2.0	Every Week	2.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				5.00

<b>Workload: Part Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Conventional Lecture	3.0	Every Week	3.00
Lecturer-Supervised Learning (Contact)	Based on Exercise Sheets	1.0	Every Week	1.00
Lab	Laboratory	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	No Description	2.0	Every Week	2.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				5.00

Module Resources
<i>Recommended Book Resources</i>
<ul style="list-style-type: none"><li>• <b>John Bird 2006, <i>Higher Engineering Mathematics</i>, Fifth Ed., Newnes</b></li></ul>
<i>Supplementary Book Resources</i>
<ul style="list-style-type: none"><li>• <b>Anthony Croft &amp; Robert Davison 1998, <i>Mathematics for Engineers-A Modern Interactive Approach</i>, Pearson [ISBN: 0-13120193-X]</b></li></ul>
<i>This module does not have any article/paper resources</i>
<i>Other Resources</i>
<ul style="list-style-type: none"><li>• <b>Website: Maple Homepagen/a</b> <a href="http://www.maplesoft.com">http://www.maplesoft.com</a></li></ul>

