



Title:	Discrete Maths APPROVED
Long Title:	Discrete Maths
Module Code:	MATH6004
Duration:	1 Semester
Credits:	5
NFQ Level:	Fundamental
Field of Study:	Mathematics
Valid From:	Semester 1 - 2019/20 (September 2019)
Module Delivered in	6 programme(s)
Module Coordinator:	Sean McSweeney
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Module Description:	Discrete mathematics encompasses a range of topics in mathematics. This module focuses in particular on the study of logic, linear algebra and recursion.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Model and solve problems using recurrence relations.
LO2	Explain and use the language, notation, and methods of symbolic logic.
LO3	Develop and apply mathematical reasoning in constructing valid arguments.
LO4	Find an inverse of a matrix and use it to solve a system of equations.
Pre-requisite learning	
Incompatible Modules	
<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	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
<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	
Co-requisites	
No Co Requisites listed	

Module Content & Assessment

Indicative Content

Recurrence Relations

Recursively defined sequences. Arithmetic and geometric sequences. Modelling using recursively defined sequences.

Logic

Propositions, logical connectives, truth tables. Compound propositions, logical equivalence, laws of logic including De Morgan's Laws. Introduction to rules of inference (Modus Ponens/Modus Tollens). Valid arguments.

Linear Algebra

Matrices and matrix operations, Gaussian elimination, algebra of matrices, matrix inversion. Applications: solving systems of linear equations, networks, geometry of linear transformations (computer graphics).

Practical Content

Introduction to appropriate mathematical software. Application of mathematical software to enhance student teaching and learning.

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 in-class exam on recurrence relations and mathematical logic.	1,2,3	20.0	Week 7
Practical/Skills Evaluation	Short in-class quizzes.	1,2,3,4	10.0	Every Second 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

Workload: Full Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Formal lecture.	3.0	Every Week	3.00
Lab	Work on assignment sheets aided by mathematical software.	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	Review of lecture notes and engage in assigned activities.	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Workload: Part Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Formal lecture	3.0	Every Week	3.00
Lab	Work on assignment sheets aided by mathematical software.	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	Review of lecture notes and engage in assigned activities	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Module Resources

Recommended Book Resources

- Peter Grossman 2009, *Discrete Mathematics for Computing*, Third Ed., Palgrave Macmillan [ISBN: 9780230216112]
- Howard Anton 2015, *Elementary linear algebra with supplemental applications*, Eleventh Ed., Wiley [ISBN: 9781118677308]

Supplementary Book Resources

- Rowan Garnier & John Taylor 2010, *Discrete Mathematics, Proofs, Structures, and Applications*, Third Ed., CRC Press [ISBN: 9781439812808]

This module does not have any article/paper resources

Other Resources

- Website: *Maple Website*
<http://www.maplesoft.com>
- Website: *Wolfram's Mathworld*
<http://www.mathworld.com>

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_KSDEV_8	<u>Bachelor of Science (Honours) in Software Development</u>	2	Mandatory
CR_KDNET_8	<u>Bachelor of Science (Honours) in Computer Systems</u>	2	Mandatory
CR_KITMN_8	<u>Bachelor of Science (Honours) in IT Management</u>	2	Mandatory
CR_KITSP_7	<u>Bachelor of Science in Information Technology</u>	2	Mandatory
CR_KCOMP_7	<u>Bachelor of Science in Software Development</u>	2	Mandatory
CR_KCOME_6	<u>Higher Certificate in Science in Software Development</u>	2	Mandatory