



Title:	Mathematics for Construction APPROVED
Long Title:	Mathematics for Construction
Module Code:	MATH6064
Duration:	1 Semester
Credits:	5
NFQ Level:	Fundamental
Field of Study:	Mathematics
Valid From:	Semester 1 - 2022/23 (September 2022)
Module Delivered in	9 programme(s)
Module Coordinator:	David Goulding
Module Author:	DONAL G O SHEA
Module Description:	This module provides the learner with the knowledge, skills and competence to solve practical mathematical problems encountered in construction.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Perform a variety of arithmetical calculations relevant to construction.
LO2	Manipulate a wide variety of algebraic expressions and equations, transpose formulae, and employ function notation effectively.
LO3	Sketch and analyse linear and quadratic graphs.
LO4	Use trigonometry to solve practical problems in construction.
LO5	Use mensuration to solve practical problems in construction.
Pre-requisite learning	
Module Recommendations	
<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>	
Not applicable	
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>	
Not applicable	
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>	
Not applicable	

Module Content & Assessment

Indicative Content

The Fundamentals of Mathematics

Manipulating numbers. The arithmetic of fractions. Decimal notation and calculations. Ratio and proportion. Percentages. Approximation, error estimation, absolute, relative and relative percentage error. Laws of indices with simple applications. Evaluation of powers, roots and reciprocals using the calculator.

Algebra

Formulation and solution of linear, quadratic and linear simultaneous equations. Simple indicial equations. Transposition and evaluation of formulae.

Linear and Quadratic Graphs

Plot a linear function. The general equation of a straight line. Deduce the equation of a straight line graph. Describe linear trend. Plot quadratic functions. Describe graphical trends. Graphical solution of quadratic equations.

Trigonometry

Types of angles and triangles. Pythagoras Theorem. Trigonometric ratios, sine rule and cosine rule. Angles of elevation and depression.

Units and Conversions

The SI system of units, prefixes, usage. Imperial and metric conversions.

Mensuration

Practical problems on area and volume: rectangle, triangle, parallelogram, trapezium, circle (inc. arcs and sectors). Simpson's rule and Trapezoidal rule. Volume and surface area: cylinder, sphere, hemisphere, cuboid, cone, frustum of cone.

Assessment Breakdown

	%
Course Work	100.00%

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	In class test - fundamentals of mathematics and algebra.	1,2	30.0	Week 4
Short Answer Questions	In class test - linear and quadratic graphs, trigonometry.	3,4	35.0	Week 8
Short Answer Questions	In class test - trigonometry, mensuration, units and conversions.	4,5	35.0	Week 12

No End of Module Formal Examination

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	Theory on course topics and worked examples.	3.0	Every Week	3.00
Tutorial	Active problem solving, completion of tutorial sheets	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	Review of lecture material, completion of homework sheets, preparation for tutorial	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	Theory on course topics and worked examples.	2.5	Every Week	2.50
Lecturer Supervised Learning (Non-contact)	Preparation for tutorial (tutorial and homework sheets)	1.0	Every Second Week	0.50
Tutorial	Active problem solving, completion of tutorial sheets	1.0	Every Second Week	0.50
Independent & Directed Learning (Non-contact)	Review of lecture material, completion of homework sheets, preparation for tutorial	3.5	Every Week	3.50
Total Hours				8.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

Module Resources

Recommended Book Resources

- J. Bird 2021, *Basic Engineering Mathematics*, 9th ed. Ed., Routledge [ISBN: 9781000351941]

Supplementary Book Resources

- K.A. Stroud, with D.J. Booth 2009, *Foundation Mathematics*, Palgrave Macmillan [ISBN: 9780230579071]

This module does not have any article/paper resources

Other Resources

- Website: *CIT Maths Online*
<https://mathematics.cit.ie/online>
- Website: *MathCentre*
<http://www.mathcentre.co.uk>
- Website: <http://www.mathtutor.ac.uk/MathTutor>

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_CCNMG_8	<u>Bachelor of Science (Honours) in Construction Management</u>	1	Mandatory
CR_CQTSU_8	<u>Bachelor of Science (Honours) in Quantity Surveying</u>	1	Mandatory
CR_CMNGT_7	<u>Bachelor of Science in Construction Management</u>	1	Mandatory
CR_ECTWB_7	<u>Bachelor of Science in Craft Technology (Wood) with Business</u>	1	Mandatory
CR_ECTMS_7	<u>Bachelor of Science in Craft Technology - Mechanical Services</u>	1	Mandatory
CR_CCECO_7	<u>Bachelor of Science in Quantity Surveying</u>	1	Mandatory
CR_EEQMF_6	<u>Certificate in Equipment Maintenance Fundamentals</u>	1	Mandatory
CR_EFDPF_6	<u>Certificate in Food Processing Fundamentals</u>	1	Mandatory
CR_CCONS_6	<u>Higher Certificate in Science in Construction</u>	1	Mandatory