Module Title:	Engineering Mathematics II
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	[2 programme(s)](#)

Teaching & Learning Strategies:	Lectures, private study.

Module Aim:	The aim of the module is to develop students' proficiency in calculus as a basis for further study in civil engineering.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Use various methods to find the roots of equations.
LO2	Apply differential and integral calculus and partial differential calculus to a variety of engineering applications.
LO3	Apply techniques to approximate definite integrals.
LO4	Solve simple first and second order differential equations.

Pre-requisite learning		
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*		
9890	MATH C1503	Mathematics and Statistics I
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		

Module Content & Assessment

Indicative Content
Roots of equations (a) Factor theorem and remainder theorem. (b) Factorising cubic equations. (c) The discriminant and roots of quadratic equations. (d) Interpolation including Newton-Raphson method.
Further calculus (a) Review of differentiation using product, quotient and chain rule. (b) Review of integration by parts, substitution and partial fractions. Applications to engineering problems including centroids. (c) Partial differentiation and application to small changes.
Approximating integrals (a) Taylor polynomials. (b) Trapezoidal rule. (c) Simpson's rule.
Introduction to ordinary differential equations (a) General solutions and particular solutions. (b) First order separable ODEs. (c) First order linear ODEs. (d) Second order linear ODEs with constant coefficients.

Assessment Breakdown	%
Continuous Assessment	50.00%
End of Module Formal Examination	50.00%

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Short Answer Questions	Quiz questions	1,2,3,4	20.00	Ongoing
Examination	Class Test 1	1,2	15.00	Week 6
Examination	Class Test 2	3,4	15.00	Week 11

No Project

No Practical

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	End of module examination	1,2,3,4	50.00	End-of-Semester

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

Module Workload

Workload: Full Time

Workload Type	Frequency	Average Weekly Learner Workload
Lecture	12 Weeks per Stage	4.00
Estimated Learner Hours	15 Weeks per Stage	6.00
	Total Hours	138.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	[Bachelor of Engineering (Honours) in Civil Engineering](#)	4	Mandatory
CW_CMCIV_D	[Bachelor of Engineering in Civil Engineering](#)	6	Mandatory