

Module Title:	Mathematics 3
Language of Instruction:	English
Credits:	5
NFQ Level:	7
Module Delivered In	No Programmes
Teaching & Learning Strategies:	1. A series of lectures will be delivered using whiteboard and data projector. 2. The Institute Managed Learning Environment will be used to interactively communicate with students e.g. on-line tests, discussion forums, reference information 3. Mathematical software (e.g. MATLAB) may be used by students to reinforce the mathematical principles and practices
Module Aim:	To familiarise the student with the mathematical concepts and techniques that s/he will encounter in the other modules of the programme.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Solve systems of linear equations using various matrix methods and calculate the eigenvalues and eigenvectors of a matrix.
LO2	Solve first order separable and first order linear differential equations and apply them to simple problems in mechanics and electrical circuits.
LO3	Solve second order linear differential equations with constant coefficients and apply them to the analysis of spring-mass systems.
LO4	Apply Laplace transforms to the solutions of first and second order initial value problems
Pre-requisite learning	
Module Recommendations	
<i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</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.</i>	
No requirements listed	

Module Content & Assessment
Indicative Content
• Matrices

Solution of simultaneous equations by matrix methods The rank of a matrix. Eigenvectors & eigenvalues of a matrix.

• Ordinary Differential Equations

First order ordinary differential equations. Applications of first order ODEs in mechanics. Second order linear ODEs with constant coefficients. Free and forced oscillations. Spring-mass systems.

• Laplace Transforms

o The Laplace transform and its inverse. First shift theorem. Laplace transforms of derivatives. Solution of first order initial value problems. Solution of second order initial value problems.

Assessment Breakdown
%

Continuous Assessment

30.00%

End of Module Formal Examination

70.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Each student will be obliged to complete a continuous assessment program for which 30% will be awarded. This will consist of class tests and other assigned tasks, which will assess the achievement of all learning outcomes.	1,2,3,4	30.00	n/a

No Project

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	A final written examination, for which 70% will be awarded, will assess the extent to which the student has achieved all the module learning outcomes.	1,2,3,4	70.00	End-of-Semester

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

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Every Week	3.00
Independent Learning Time	Every Week	4.00
Total Hours		7.00

