Module Title:	Applied Maths (Elective1-Core)

Credits:	10

NFQ Level:	6

Module Delivered In	No Programmes

Teaching & Learning Strategies:	A mix of traditional lectures and programming practicals that will enable the student to fully understand the use of mathematical methods in computer graphics and apply these ideas in their own computer code.

Module Aim:	To provide the student with an understanding of the mathematics required to model the real world as applied in computer graphics.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	carry out vector and matrix operations;
LO2	use matrices to represent and carry out transformations and rotations in 2D space;
LO3	manipulate complex numbers and use them in 2D graphics rotations;
LO4	apply the mathematical methods required for colour manipulation in computer graphics;
LO5	represent mathematical structures in computer code
LO6	write computer programmes to further explore the concepts of this syllabus

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
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
Trigonometry angles, trigonometric functions and Pythagoras's theorem.
Vectors vector properties, operations on vectors, dot products, cross products, dimensions, normalisation, geometric interpretations
Matrices: matrix properties, linear systems, matrix inverses, determinants.
Complex Numbers the argand diagram, operations on complex numbers, conjugates, Euler's identity, 2D rotations with complex numbers.
Transforms in 2D: coordinate systems, simple translations, scaling transforms, rotational transforms.
Illumination: RGB colour, light sources, diffuse lighting, specular lighting.
3D Engine Geometry: lines in 3D space, planes in 3D space, the view frustum.

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	30.00%
End of Module Formal Examination	50.00%

Continuous Assessment				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	CA marks will be based on the results of four or five 45 minute tests held during the term.	1,2,3,4,5,6	20.00	n/a

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Practical marks will be allocated for participation in and completion of the practical exercises	5,6	30.00	n/a

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	The terminal examination will include question on all aspects of the course.	1,2,3,4,5,6	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	30 Weeks per Stage	3.00
Laboratory	30 Weeks per Stage	1.00
Estimated Learner Hours	30 Weeks per Stage	1.00
	Total Hours	150.00