ENGR C1501: Engineering Science I

Module Title:	Engineering Science I
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	- Lectures - Project - Laboratory practicals - Private study

Module Aim:	This module aims to provide students with an understanding of the fundamental principles and applications of engineering science and to develop practical laboratory skills in physics.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Demonstrate their knowledge and understanding of key principles of physics as applied to civil engineering.
LO2	Demonstrate an understanding of physical quantities, units, force systems, friction, stress and strain
LO3	Define, calculate and graphically represent component forces, resultant forces, moments, simple beam reactions, shear force and bending moments.
LO4	Explain the theory behind practical experiments carried out in the laboratory. Apply scientific procedures, including recording and analysing experimental data. Demonstrate an understanding of the principles behind basic laboratory instruments.

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

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Module Content & Assessment

Indicative Content
Units and Physical Quantities (a) The International System of Units: mass, length, time, density, relative density, force, weight and unit weight.
Forces (a) Resultant of a system of forces, (b) Parallelogram law, (c) Equilibrium, (d) Triangle of forces, (e) Polygon of forces, (f) Resolution of forces.
Moments (a) Moment of a force, (b) Supports (c) Beam Reactions (d) Types of Loads
Friction (a) Laws of dry friction, (b) Limiting friction, (c) Friction on horizontal and inclined planes, (d) Angle of friction and the total reaction.
Shear and Bending Moment Diagrams (a) Shear and bending moment diagrams (b) Point and uniform distributed force loading
Stress and Strain (a) Direct stress and strain, (b) Hooke's law, (c) Modulus of elasticity.
Practicals Introduction to the Physics Laboratory; Mass Weight and Density; Acceleration Due to Gravity Using a Simple Pendulum; Hooke's Law and Experiments using a Spiral Spring; Determine Youngs Modulus for a Wire; Friction Experiments; Vector Addition of Forces/Resolving Forces; Investigating Moments of Forces; Demonstrating Newton's Laws using Pullys.

Assessment Breakdown	%
Project	50.00%
Practical	50.00%

No Continuous Assessment

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	No Description	1,2,3	50.00	n/a

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	A two-hour practical each week	1,2,3,4	50.00	Every Week

No End of Module Formal Examination

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

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	3.33
Laboratory	12 Weeks per Stage	1.67
Estimated Learner Hours	12 Weeks per Stage	5.42
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMCIV_D	Bachelor of Engineering in Civil Engineering	1	Mandatory