

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	
<i>On successful completion of this module the learner should be able to:</i>	
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	
<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

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 Young's Modulus for a Wire; Friction Experiments; Vector Addition of Forces/Resolving Forces; Investigating Moments of Forces; Demonstrating Newton's Laws using Pulleys.

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

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
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