Module Code	CEU11E07
Module Name	1E7 Mechanics
ECTS Weighting[2]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Dermot O'Dwyer & Henry Rice
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1. Apply Newton's laws to solve a range of mechanics problems involving static equilibrium. These include problems involving: pulleys, inclined planes, levers, wheels (cogs & belts etc.), pin-jointed trusses, friction etc. LO2. Apply Newton's laws to solve a range of mechanics problems involving the motion of an object or system under the action of a force or torque. These include problems involving: circular motion, relative motion, simple harmonic motion, special cases with constant acceleration, conservation of momentum etc. and apply Newton's laws to problems involving hydrostatics and/or continuous flow. LO3. Perform a number of standard calculations including: calculation of the moment due to a force, calculation of the depth of the centre of pressure of a hydrostatic force on a submerged surface, calculation of the buoyance force on an object, calculation of the moment of inertia and position of the centre of mass of an object. LO4. Apply the principle of conservation of energy to solve mechanics problems. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Not embedded To communicate effectively - Not embedded

[1] An Introduction to Module Design from AISHE provides a great deal of information on designing and re-designing modules.
[2] TEP Glossary

Module Content	The objective of this module is to help students develop the techniques needed to solve general engineering mechanics problems. Students will learn to describe physical systems mathematically so that their behaviour can be predicted. This course is based firmly on Newtonian Mechanics (Newton's three laws). Module content Statics – Introduction • Vectors • Newton's Laws • Fundamental Units Static Equilibrium – Forces • Types of force • Resultant forces • Moments and couples Static Equilibrium – application • Pulley problems • Pin jointed truss analysis • Truss analysis by method of sections • Problems involving friction Hydrostatics – distributed forces • Hydrostatic Pressure • Archimedes Principle • Centre of pressure Dynamics – Introduction • Basic concepts • Newton's Laws

	• Formulation and solution of problems Kinematics of Particles • Rectilinear motion • Curvilinear motion • Relative motion Kinetics of Particles • Newton's second Law • Work and energy • Impulse and momentum Rigid Body Motion • General equations of motion (2D planar) • Rotation • Centre of mass • Moment of inertia • Work-energy relations • Impulse and momentum Simple Harmonic Motion
Teaching and Learning Methods	The module is taught using a combination of lectures, home-based laboratories and tutorials. Module materials (tutorials and solutions) are provided in electronic form.

Assessment Details[3] **Please include the following:**	Assessment Component	Assessment Description	LO Addressed	% of total	Week due

[3] TEP Guidelines on Workload and Assessment

• **Assessment Component** • **Assessment description** • **Learning Outcome(s) addressed** • **% of total** • **Assessment due date**	Home Labs	Five experiments that are undertaken by the students using materials and equipment that are to be found at home.	1 - 4	10%	Staggered throughout term
	Class test	Trial set of questions given to the class in the first few days after term ends to aid their revision.	1 - 4	10%	First half of week 13.
	Examination	MCQ exam with 20 questions	1 - 4	80%	End of Term Exam

Reassessment Requirements	
Contact Hours and Indicative Student Workload[3]	**Contact hours: 44** **Independent Study (preparation for course and review of materials):** **Independent Study (preparation for assessment, incl. completion of assessment):** 81 hours. Approximately 11 hours would be required to perform the five
Recommended Reading List	Statics and Dynamics by Bedford and Fowler (or similar)
Module Pre-requisite	None
Module Co-requisite	None
Module Website	Blackboard
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	Delivered by Civil and Mechanical
Module Approval Date	
Approved by	
Academic Start Year	September 2022
Academic Year of Date	2022-23