

<b>Module Title:</b>	Dynamics 3
<b>Language of Instruction:</b>	English
<b>Credits:</b>	5
<b>NFQ Level:</b>	7
<b>Module Delivered In</b>	No Programmes
<b>Teaching &amp; Learning Strategies:</b>	The module will be delivered using lectures and tutorials with a mixture of presentations, example exercises, question and answer sessions, group discussions and online resources. Laboratory classes will be delivered to students working in groups to obtain experimental data with subsequent individual reporting/assessment.
<b>Module Aim:</b>	<ul style="list-style-type: none"> <li>• To provide the student with a specialized knowledge of the internal effects of forces applied to members in structures and mechanisms, as evidenced by the stresses and deformations produced.</li> <li>• To provide the student with a specialized knowledge of the external effects of forces applied to particles and to rigid links, as evidenced by the change of motion produced</li> </ul>

Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Analyze mathematically the relationship between the motion of a particle/rigid body and the forces to which it is subjected by the appropriate methods - Force-Mass-Acceleration/Energy/Impulse/Momentum.
LO2	Analyze mathematically the applications of friction in mechanisms such as the plate and the cone-clutch.
LO3	Balance systems of rotating masses in single-plane and multi-plane applications.
LO4	Analyze mathematically the three-dimensional motion of a rigid body such as a gyroscope.
LO5	Quantify by calculation and experimental measurement the characteristic response of mechanical systems.

Pre-requisite learning
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>
No recommendations listed
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>
No incompatible modules listed
<b>Co-requisite Modules</b>
No Co-requisite modules listed
<b>Requirements</b> <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**
**• Kinetics of a particle**

Force-mass-acceleration - Application to linked objects. Energy methods. Impulse-momentum method.

**• Kinetics of Rigid bodies**

Plane motion of rigid bodies: Translation.

**• Balancing of Rotating Masses**

Single plane balancing. Multi-plane balancing.

**• Motion in three dimensions**

Introduction to three-dimensional motion. Gyroscopic couple. Euler's dynamical equations.

**• Applications of friction in machines**

Plate clutch. Cone clutch. Torque transmission in geared systems.

Assessment Breakdown	%
Continuous Assessment	15.00%
Practical	15.00%
End of Module Formal Examination	70.00%

**Continuous Assessment**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Students will be expected to sit a number of individual assessments throughout the academic year, typically at the conclusion of one or more learning outcomes.	1,2,3,4	15.00	n/a

No Project

**Practical**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Laboratory sessions will be assessed by written reports and/or written laboratory assessments. Students will be assigned to groups for the execution of the laboratory practical work but reports must be submitted on an individual basis.	2,3,5	15.00	n/a

**End of Module Formal Examination**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	A final written examination will assess the extent to which the student has achieved 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**

<b>Workload: Full Time</b>		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Every Week	2.75
Laboratory	Every Week	0.25
Estimated Learner Hours	Every Week	2.00
Total Hours		5.00

