PHYS C1601: Dynamic Mechanics

Module Title:	Dynamic Mechanics
Credits:	5
NFQ Level:	6
Module Delivered In	4 programme(s)
Teaching & Learning Strategies:	The student will be exposed to learning experiences grounded in both classroom and virtual practice. The experiences will be linked through collective analysis, teamwork, and individual challenges.
Module Aim:	To provide the student with an understanding of the underlying scientific principles of the dynamics of mechanical systems.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Interpret written descriptions of practical dynamic problems.
LO2	Translate written descriptions of dynamic systems into mathematical form as part of the solution.
LO3	Select appropriate mathematical formulae for a given dynamics problem and solve.
LO4	Perform experiments on mechanical engineering dynamics topics and interpret the results.

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
Linear Motion Acceleration, Speed, Velocity, Displacement, Motion. Newton's Laws of Motion. Equations of Motion. Velocity-Time Graphs.
Kinetic Friction Laws of Friction. Limiting Friction. Friction on Horizontal and Inclined Planes.
Energy, Work and Power Work Done by a Force. Power. Work done by Torque. Tractive Effort and Tractive Resistance.
Linear Momentum Elastic and Non-Elastic Collisions. Conservation of Momentum. Kinetic Energy. Potential Energy. Conservation of Energy.
Circular Motion. Angular Velocity and Acceleration. Equations of Motion. Torque. Moment of Inertia. Combined Angular and Linear Motion. Energy and Work.
Simple Machines Law of a Machine. Mechanical Advantage. Velocity ratio. Efficiency and Limiting Efficiency. Applications to Simple Machines.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	In Class/Online Assessment	1,2,3	10.00	Week 6

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Written lab reports on a number of lab experiments: Work and Energy, Friction on an Incline, Screw Jack, Worm and Worm Wheel, Angular Motion. Atwood Machine	1,2,3,4	20.00	Every Second Week
Practical/Skills Evaluation	Computer Competencies Assignment	1,2,3,4	10.00	End-of-Semester

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	An end of module terminal examination assessing all content covered from week 1.	1,2,3	60.00	End-of-Semester

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	4.00
Laboratory	12 Weeks per Stage	1.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	2	Mandatory
CW_EEROB_B	Bachelor of Engineering (Honours) in Robotics and Automated Systems	2	Mandatory
CW_EEMEC_D	Bachelor of Engineering in Mechanical Engineering	2	Mandatory
CW_EEROO_D	Bachelor of Engineering in Robotics and Automated Systems	2	Mandatory