PHYS C1F02: Applied Physics for Agriculture 1

Module Title:	Applied Physics for Agriculture 1
Language of Instruction:	English

Credits:	10

NFQ Level:	6

Module Delivered In	2 programme(s)

Teaching & Learning Strategies:	Lectures, laboratories, demonstrations, research, project work and some study will be used to ensure the student has a wide range of experiences.

Module Aim:	The aim of this module is to provide the learner with an introduction to the principles of physics and their importance and relevance to sustainable agricultural science and engineering. The module will develop practical laboratory skills.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Interpret written descriptions ofpractical static and dynamic problems relating to agricultural engineering applications.
LO2	Translate written descriptions of practical static and dynamic engineering problems into mathematical form.
LO3	Apply and solve formulae involving the interaction of the motion of an object and the forces and torques to which it is subjected with particular emphasis on agricultural applications.
LO4	Analysemathematically 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 - as applied to agricultural engineering applications.
LO5	Contribute effectively, as an individual and as part of a group, to the planning and realization of investigations in a laboratory environment into the effects of applied forces on components.Report on the findings

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.*
CAD 1 or equivalent

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Module Content & Assessment

Indicative Content
Theory - Units • Mass, length, time, density, relative density, force, weight and the International system of units.
Static Friction • Static Friction Coefficient, Coulombs Laws. • Non-Parallel Applied Force.
Strength of Materials • Direct Stress and Strain. • Hooke's Law. Modulus of elasticity. • Factor of Safety.
Moments of Forces • Principle of Moments. • Static Equilibrium. • Reaction Forces. • Applications of Moments.
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.
Practical Laboratory Experiments • Carry out a series of engineering lab experiments and produce relevant lab reports. Experiments will include: Principle of Moments • Centre of Gravity • Simple Machines •Stress and Strain • Hooke's Law• Coefficient of friction (Horizontal Plane) • Coefficient of friction (Inclined Plane) • Modulus of Rigidity • Young's Modulus

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	30.00%
End of Module Formal Examination	50.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Class test	1,2,3	20.00	Week 6

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Conduct Applied Agricultural Science and Engineering Science Laboratory Experiments. Report on findings.	5	30.00	Every Week

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	End of semester examination	1,2,3,4	50.00	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	2.00
Laboratory	12 Weeks per Stage	2.00
Lab/Lecture	12 Weeks per Stage	2.00
Independent Learning	15 Weeks per Stage	11.07
	Total Hours	238.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EFARG_B	Bachelor of Engineering (Honours) in Agricultural Systems Engineering	1	Mandatory
CW_EFARG_D	Bachelor of Engineering in Agricultural Systems Engineering	1	Mandatory