

Module Title:	Aviation Science 2
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	3 programme(s)
Teaching & Learning Strategies:	The course delivery is a mixture of active learning and prescribed learning. Prescribed learning will take the form of lectures where the student will be introduced to core concepts in Physics with a particular focus on topics that are relevant to their aeronautical career such as linear and rotational motion as well as engine design and fibre optics. Active learning will take the form of laboratory exercises where students will develop problem-solving skills as well as examine and measure fundamental processes in Physics. The goal of these active learning sessions in the laboratory will be to facilitate the student to be able to relate the prescribed unistructural and multistructural knowledge of the lectures with real-life objects thereby developing important relational knowledge.
Module Aim:	The aim of this module is to allow the student the opportunity to understand difficult but fundamental ideas from Physics with an emphasis on their practical ramifications. It is furthermore envisioned that the knowledge developed here can later be extended as it will complement later modules, which they will undertake in their degree, that focus on propulsion systems, optical measurements, and communications.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Develop knowledge of the various fields of study in Physics namely matter, kinetics, dynamics, thermodynamics, wave-motion and optics.
LO2	Demonstrate the mathematical skills required to apply formulae to real-life objects and problems.
LO3	Analyse and appraise experimental data in a laboratory environment.
LO4	Gain experience of various forms of instrumentation and measurement equipment.
LO5	Develop and extend problem-solving skills through active learning in the laboratory environment.
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

Matter

Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds. States: solid, liquid and gaseous; Changes between states.

Kinetics

Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/centripetal forces); Velocity ratio, mechanical advantage and efficiency.

Dynamics

Mass Force, inertia, work, power, energy (potential, kinetic and total energy); Momentum, conservation of momentum; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).

Thermodynamics

Temperature scales, Heat transfer, Laws of thermodynamics, Gas laws.

Optics

Nature of light; speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, lenses; Fibre optics.

Wave Motion and Sound

Wave motion: mechanical waves, sinusoidal wave motion, Periodic motion: simple harmonic motion; Simple theory of vibration, harmonics and resonance; interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.

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
Other	Class test	1,2	10.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Laboratories that relate to measurement equipment and physical object's behaviour will develop problem-solving skills through active learning.	3,4,5	30.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	At the end of the semester, a final examination will be given that will comprise the prescriptive lecture material over the entire semester	1,2,5	60.00	End-of-Semester

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	3.00
Practicals	12 Weeks per Stage	2.00
Independent Learning	15 Weeks per Stage	4.33
Total Hours		125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEAER_B	Bachelor of Engineering (Honours) in Aerospace Engineering	2	Mandatory
CW_EEACS_D	Bachelor of Engineering in Aircraft Systems	2	Mandatory
CW_EEPLT_D	Bachelor of Science in Pilot Studies	2	Mandatory