

Module Title:	Propellers
Language of Instruction:	English
Credits:	5
NFQ Level:	7
Module Delivered In	No Programmes
Teaching & Learning Strategies:	This module will be taught by Lectures & Tutorials and by using standard aircraft equipment, model aircraft and test equipment.
Module Aim:	The student will understand the working principles of propellers and basic maintenance procedures on propellers as found on modern commercial aircraft used throughout the aircraft industry.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the operating principles of the different types of propeller
LO2	Describe the maintenance that maybe performed on a propeller
LO3	Perform calculations to statically and dynamically balance a rotating mass
LO4	Calculate the thrust and efficiency of a propeller.
LO5	Determine the maximum torque that a propeller shaft can transmit
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

Fundamentals

Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance

Propeller Construction

Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speed propeller; Propeller/spinner installation

Propeller Pitch Control

Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection. Reverse pitch protection and associated electronic systems.

Propeller Synchronising

Synchronising and synchrophasing equipment

Propeller Ice Protection

Fluid and electrical de-icing equipment.

Propeller Maintenance

Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.

Propeller Storage and Preservation

Propeller preservation and depreservation

Assessment Breakdown	%
Continuous Assessment	30.00%
End of Module Formal Examination	70.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	Each student will take short answer question exams, administered during term time for which a maximum of 30% will be awarded	1,2,3,4,5	30.00	n/a

No Project

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Each student will sit a formal written examination at the end of the module for which a maximum of 70% will be awarded.	1,2,3,4,5	70.00	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	Every Week	1.50
Tutorial	Every Week	0.50
Independent Learning Time	Every Week	2.00
Total Hours		4.00

