

Module Title:	Aviation Maintenance Practices
Language of Instruction:	English
Credits:	10
NFQ Level:	8
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	The following tools will be used to teach this module: • Practical project assignments prepared using project based learning techniques • Workshop training sessions to enhance student practical skills • Practical demonstrations of all tooling and equipment
Module Aim:	The student will be able to understand, identify and correctly handle standard materials, components, and hardware, as well as comply with safety procedures and basic standard practices that are commonly used throughout the aircraft industry.

Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Apply health and safety requirements in a workshop environment.
LO2	Describe the standard maintenance practices that are employed in aircraft maintenance.
LO3	Use standard aircraft maintenance tools and procedures and be cognisant of any ethical issues pertaining to their use.
LO4	Describe and use the various manuals that are synonymous with Aircraft Maintenance e.g. Maintenance Manual, Wiring Diagram Manual.
LO5	Perform standard calculations that may be used in aircraft maintenance.

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

Safety Precautions - Aircraft and Workshop

Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.

Workshop Practices

Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration requirements.

Tools

Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods. Operation, function and use of electrical general test equipment;

Avionic General Test Equipment

Operation, function and use of avionic general test equipment.

Engineering Drawings, Diagrams and Standards

Microfilm, microfiche and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.

Fits and Clearances

Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.

Electrical Wiring Interconnection System (EWIS)

Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance and cleanliness standards.

Riveting

Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.

Pipes and Hoses

Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.

Springs

Inspection and testing of springs.

Bearings

Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.

Transmissions

Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.

Control Cables

Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.

Material handling

Sheet Metal. Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work. Composite and non-metallic. Bonding practices; Environmental conditions Inspection methods.

Welding, Brazing, Soldering and Bonding

Soldering methods; inspection of soldered joints. Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.

Aircraft Weight and Balance

Centre of Gravity/Balance limits calculation: use of relevant documents; Preparation of aircraft for weighing; Aircraft weighing.

Aircraft Handling and Storage

Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.

Disassembly, Inspection, Repair and Assembly Techniques

Types of defects and visual inspection techniques. Corrosion removal, assessment and re-protection. General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes; Non destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods. Disassembly and re-assembly techniques. Trouble shooting techniques.

Abnormal Events

Inspections following lightning strikes and HIRF penetration. Inspections following abnormal events such as heavy landings and flight through turbulence.

Maintenance Procedures

Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection/Quality Control/Quality Assurance; Additional maintenance procedures. Control of life limited components, Ethical considerations for engineers.

Assessment Breakdown

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	20.00%
End of Module Formal Examination	60.00%

Continuous Assessment				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Written Report	Students will be required to submit a written report (approximately 1000 words) relating to a topic on Aircraft Maintenance Practices.	1,2,3,4	10.00	Week 5
Examination	A written assessment	1,2,4,5	10.00	Week 9

No Project

Practical				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Practical/Skills Evaluation	Each student will complete a series of practical tasks during the module with a brief task report, administered during term time for which a maximum of 20% will be awarded.	3,4	10.00	Every Week
Practical/Skills Evaluation	Students will be tested on a variety of skill that they acquired in the module.	3,4,5	10.00	Week 12

End of Module Formal Examination				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Formal Exam	Each student will sit a formal written examination a the end of the module for which a maximum of 70% will be awarded.	1,2,4,5	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	4.00
Practicals	12 Weeks per Stage	4.00
Independent Learning	15 Weeks per Stage	10.27
Total Hours		250.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEAER_B	Bachelor of Engineering (Honours) in Aerospace Engineering	4	Mandatory
CW_EEACS_D	Bachelor of Engineering in Aircraft Systems	4	Mandatory