

Module Title:	Aircraft Structures
Language of Instruction:	English
Credits:	5
NFQ Level:	7
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	This module will be taught by Lectures, Tutorials & Practical Tasks and by using Model & Actual Aircraft and Sample Questions.
Module Aim:	The student will understand standard airframe components, structures and standard practices so they develop basic analytical, troubleshooting and practical skills essential to an aircraft technician.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Explain the general design concepts of an aircraft structure
LO2	Compare and contrast the various methods of aircraft construction
LO3	Identify and compare the various types of air/rotorcraft fuselage, wing and structural designs
LO4	Categorise primary, secondary and tertiary flight control construction methods
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

Airframe Structures - General Concepts

Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision. Aircraft bonding Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks

Airframe Structures - Aeroplanes

Fuselage (ATA 52/53/56): Construction and pressurisation sealing; Wing, stabiliser, pylon and undercarriage attachments; Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices; Windows and windscreen construction and mechanisms Wings (ATA 57) Construction; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments Stabilisers (ATA 55) Construction; Control surface attachment Flight Control Surfaces (ATA 55/57) Construction and attachment; Balancing - mass and aerodynamic Nacelles/Pylons (ATA 54) Nacelles/Pylons: - Construction; - Firewalls; - Engine mounts

Flight Controls (ATA 27)

Primary controls: aileron, elevator, rudder, spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic, electrical, Fly-by-wire; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks systems; Balancing and rigging; Stall protection/warning system

Assessment Breakdown	%
Continuous Assessment	30.00%
Project	40.00%
Practical	30.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Written Report	Each student will accurately record and collate evidence of their practical tasks/activities into a Training Logbook, during term time for which a maximum of 30% will be awarded	1,2,3,4	30.00	n/a

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Each student will record and collate a range of their own personal experiences into a Journal/Reflective Learning Portfolio, during term time for which a maximum of 40% will be awarded	1,2,3,4	40.00	n/a

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Each student will successfully complete a range of Practical Labs/Engineering Tasks on aircraft/engines during term time for which a maximum of 30% will be awarded	1,2,3,4	30.00	n/a

No End of Module Formal Examination

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	6	Elective
CW_EEACS_D	Bachelor of Engineering in Aircraft Systems	6	Mandatory