

<b>Module Title:</b>	Aircraft Structures
<b>Language of Instruction:</b>	English
<b>Credits:</b>	5
<b>NFQ Level:</b>	7
<b>Module Delivered In</b>	<a href="#">2 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	This module will be taught by Lectures, Tutorials & Practical Tasks and by using Model & Actual Aircraft and Sample Questions.
<b>Module Aim:</b>	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.
<b>Learning Outcomes</b>	
<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
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b>	
<i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
<b>Incompatible Modules</b>	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b>	
<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**

<b>Workload: Full Time</b>		
<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	<a href="#">Bachelor of Engineering (Honours) in Aerospace Engineering</a>	6	Elective
CW_EEACS_D	<a href="#">Bachelor of Engineering in Aircraft Systems</a>	6	Mandatory