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| Module Title: | Aircraft Systems |
| 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 practical work on actual aircraft/engines. Concepts will be demonstrated using model and actual aircraft. |
| Module Aim: | The student will understand various aircraft systems and intermediate maintenance procedures so they develop basic analytical, troubleshooting and practical skills essential when working on aircraft systems. |
| Learning Outcomes | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | Explain and describe the operation of each aircraft system |
| LO2 | Describe, Demonstrate and carry out correct procedures to ensure safe operation of each aircraft system |
| LO3 | Identify and Troubleshoot common problems/faults in each aircraft system |
| LO4 | Describe the interrelationships between aircraft systems and how they affect one another |
| LO5 | Describe the various types of on-board aircraft systems and explain their operation |
| 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

Air Conditioning and Cabin Pressurisation (ATA 21)

Air supply Sources of air supply including engine bleed, APU and ground cart Air Conditioning Air conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system Pressurisation Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers Safety and warning devices Protection and warning devices Heating Systems

Instruments/Avionic Systems

Instrument Systems (ATA 31) Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems; Glass cockpit Other aircraft system indication Avionic Systems Fundamentals of system lay-outs and operation of; Auto Flight (ATA 22); Communications (ATA 23); Navigation Systems (ATA 34)

Equipment and Furnishings (ATA 25)

Emergency equipment requirements; Seats, harnesses and belts Cabin lay-out; Equipment lay-out; Cabin Furnishing Installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs

Fire Protection (ATA 26)

Fire and smoke detection and warning systems; Fire extinguishing systems; System tests Portable fire extinguisher

Fuel Systems (ATA 28)

System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling; Longitudinal balance fuel systems

Hydraulic Power (ATA 29)

System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Pressure Control; Filters Power distribution; Indication and warning systems; Interface with other systems

Ice and Rain Protection (ATA 30)

Ice formation, classification and detection; Anti-icing systems: electrical, hot air and chemical; De-icing systems: electrical, hot air, pneumatic and chemical; Rain repellent; Probe and drain heating; Wiper systems

Landing Gear (ATA 32)

Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and autobraking; Tyres; Steering Air-ground sensing

Oxygen (ATA 35)

System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings

Pneumatic/Vacuum (ATA 36)

System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems

Water / Waste (ATA 38)

Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing; Corrosion aspects

Integrated Modular Avionics (ATA42)

Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: . Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc. Core System; Network Components;

Cabin Systems (ATA44)

- The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions. - The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels. - The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: Data/Radio Communication, In-Flight Entertainment System The Cabin Network Service may host functions such as: . Access to pre-departure/departure reports, . E-mail/intranet/internet access, . Passenger database, Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System; Miscellaneous Cabin System

Information Systems (ATA46)

- The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. - Typical examples include: Air Traffic and Information Management Systems and Network Server Systems Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System

Assessment Breakdown

%

Continuous Assessment

15.00%

Practical

30.00%

End of Module Formal Examination

55.00%

| Continuous Assessment | | | | |
|------------------------|--|--------------------------|-------------------|------------------------|
| <i>Assessment Type</i> | <i>Assessment Description</i> | <i>Outcome addressed</i> | <i>% of total</i> | <i>Assessment Date</i> |
| Short Answer Questions | Each student will take Sketch/Drawing/Short Answer-format Continuous Assessment exams, administered during term time for which a maximum of 10% will be awarded. | 1,2,3,4,5 | 15.00 | n/a |

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| No Project |
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| 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 range of practical tasks, administered during term time for which a maximum of 30% will be awarded | 2,3,4,5 | 30.00 | n/a |

| 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 at the end of the module for which a maximum of 55% will be awarded. | 1,2,3,4,5 | 55.00 | 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 | 2.00 |
| Practicals | Every Week | 1.50 |
| Tutorial | Every Week | 1.00 |
| Total Hours | | 4.50 |

