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| Module Title: | Avionics 2 |
| Language of Instruction: | English |
| Credits: | 5 |
| NFQ Level: | 8 |
| Module Delivered In | 1 programme(s) |
| Teaching & Learning Strategies: | A combination of lectures, class discussion, tutorial, laboratory, flight simulator exercises and demonstrations will be used. Emphasis will be placed on active learning including problem / project bases learning. |
| Module Aim: | To provide the student with the competency and skills for radio and navigation systems on modern aircraft. |
| Learning Outcomes | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | Evaluate the principle of operation of AM, FM radio transmitters, receivers and their use in avionic systems. |
| LO2 | Explain the operation of ground based navigation beacons and their associated airborne based receivers / transmitters and understand the use of avionic test equipment to analyse their operation. |
| LO3 | Access the operation of satellite and inertial based navigation systems. |
| LO4 | Describe the operation of an aircraft autopilot system and explain how the inner and outer interfaces operate as part of the automatic flight control system for the aircraft. |
| LO5 | Discuss the operation of the flight controls on an aircraft and their function as part of the overall autopilot control system. |
| 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

Communication and Navigation

Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter; Working principles of the following systems: Very High Frequency (VHF) communication; High Frequency (HF) communication; Audio; Emergency Locator Transmitters; Cockpit Voice Recorder; Very High Frequency omnidirectional range (VOR); Automatic Direction Finding (ADF); Instrument Landing System (ILS); Flight Director systems; Distance Measuring Equipment (DME); ; Area navigation, RNAV systems; Flight Management Systems; Global Positioning System (GPS); Global Navigation Satellite Systems (GNSS); Inertial Navigation System; Air Traffic Control transponder, secondary surveillance radar; Traffic Alert and Collision Avoidance System (TCAS); Weather avoidance radar; Radio altimeter; MEMS and range sensors, systems programming, data filtering.

Autoflight

Fundamentals of automatic flight control including working principles and current terminology; Command signal processing; Modes of operation: roll, pitch and yaw channels; Yaw dampers; Stability Augmentation Systems; Automatic trim control; Autopilot navigation aids interface; Autothrottle systems. Automatic Landing Systems: principles and categories, modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions. , GPS augmented landing systems,

| Assessment Breakdown | % |
|----------------------------------|--------|
| Continuous Assessment | 10.00% |
| Practical | 30.00% |
| End of Module Formal Examination | 60.00% |

Continuous Assessment

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|---|-------------------|------------|-----------------|
| Examination | Students will sit an examination during the module. | 1,2,5 | 10.00 | Week 7 |

No Project

Practical

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------------------|--|-------------------|------------|-----------------|
| Practical/Skills Evaluation | Students will complete a number of practical assignments during the module and produce a report on each assignment | 1,2,3,4,5 | 30.00 | n/a |

End of Module Formal Examination

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|--|-------------------|------------|-----------------|
| Formal Exam | The written examination, at the end of the module, will evaluate the extent of the student's knowledge of the learning outcomes. | 1,2,3,4,5 | 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 | 2.00 |
| Practicals | 12 Weeks per Stage | 4.00 |
| Independent Learning Time | 15 Weeks per Stage | 3.53 |
| Total Hours | | 125.00 |

Module Delivered In

| Programme Code | Programme | Semester | Delivery |
|----------------|---|----------|-----------|
| CW_EEACS_D | Bachelor of Engineering in Aircraft Systems | 5 | Mandatory |