Module Title:	Radio Communication and Navigation Systems
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	No Programmes

Teaching & Learning Strategies:	Lectures will be delivery using PowerPoint, handouts and interactive learning techniques.

Module Aim:	To provide the student with the competency and skills for radio and navigation systems on modern aircraft..

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe the principle of operation of AM, FM radio transmitters, receivers and their use in avionic systems
LO2	Describe and explain the detailed operation of ground based navigation beacons and their associated airborne based receivers / transmitters and identify the use of test equipment to analyse their operation
LO3	Discuss and illustrate the different types of cabin and information systems.
LO4	Describe and explain the detailed operation of the different types of automatic landing systems used on aircraft
LO5	Discuss the use of Integrated modular avionics and their application on modern aircraft

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

Module Content & Assessment

Indicative Content

Communication/Navigation
Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter; Working principles of 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); Microwave Landing System (MLS); Flight Director systems; Distance Measuring Equipment (DME); Very Low Frequency and hyperbolic navigation (VLF/Omega); Doppler navigation; 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; ARINC communication and reporting; UAV technology, MEMS and range sensors, systems programming, mission control, data filtering.GPS landing systems,Aircraft tracking systems.

Equipment and Furnishings (ATA 25)
Electronic emergency equipment requirements; Cabin entertainment equipment

On board Maintenance Systems (ATA 45)
Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).

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-fight 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 Systems Cabin Mass Memory System; Cabin Monitoring System; Miscellaneous Cabin System.

Information Systems (ATA 46)
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 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	10.00%
Practical	20.00%
End of Module Formal Examination	70.00%

Continuous Assessment				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	Students will complete assignments as part of the assessment of this module.	2,4	10.00	Week 6

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	The student will complete practical assignments during the module and write a report on each assignment	1,2,3	15.00	n/a
Practical/Skills Evaluation	The student will complete a test during the module	1,2	5.00	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	70.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	Every Week	3.00
Practicals	Every Week	1.50
Independent Learning	Every Week	2.00
	Total Hours	6.50