Module Title:	Digital Techniques
Language of Instruction:	English

Credits:	10

NFQ Level:	6

Module Delivered In	No Programmes

Teaching & Learning Strategies:	A combination of lectures, class discussion, tutorial, laboratory exercises and demonstrations will be used. Particular emphasis will be placed on active learning including problem / project bases learning

Module Aim:	To give students an understanding of digital electronics and give them an appreciation of how digital sub-circuits can be combined to form an overall functioning digital system.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Classify and apply the different numbering systems and their applications in digital electronics
LO2	Describe the process of conversion of analogue data for digital transmission using different types of transmission media
LO3	Analyse digital systems schematics and test the operation of these systems
LO4	Describe the principle of operation of different microprocessors and demonstrate how these devices are interfaced to peripherals

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

Numbering Systems
Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.

Data Conversion
Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.

Logic Circuits
Identification of common logic gate symbols, tables and equivalent circuits; Applications used for Aircraft Systems, schematic diagrams. Interpretation of logic diagrams.

Basic Computer Structure
Computer related terminology; Operation, layout and interface of the major components in a micro computer including their associated bus systems; Information contained in single and multiaddress instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems

Microprocessors
Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.

Integrated Circuits
Operation and use of encoders and decoders; Function of encoder types; Uses of medium, large and very large scale integration

Multiplexing
Operation, application and identification in logic diagrams of multiplexers and demultiplexer.

Fibre Optics
Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in Aircraft Systems.

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
Other	Students will be assigned a number of assignments as part of the assessment of this module. Students may be asked to complete assignments during tutorials or as homework	1,2,4	10.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students will complete practical assignments during the course of the module. Students will be required to maintain a laboratory logbook and write a brief report on each assignment.	2,3,4	10.00	n/a
Practical/Skills Evaluation	Each student will complete two formal practical tests.	2,3,4	10.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	A final written examination will assess the learning outcomes to the full extent.	1,2,4	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	2.50
Practicals	Every Week	2.00
Independent Learning	Every Week	1.50
	Total Hours	6.00