PROC H3601: Signal Processing

Module Title:	Signal Processing
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	No Programmes

Teaching & Learning Strategies:	This module will be delivered through lectures and laboratory assignments.

Module Aim:	To introduce the student to signal processing techniques and applications

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Understand and analyse signals.
LO2	Specify signal processing requirements.
LO3	Apply signal processing techniques.
LO4	Design simple digital filters.
LO5	Use software packages for the purposes of digital filter design.

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.*
Mathematics 1 & 2 or equivalent

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Module Content & Assessment

Indicative Content
A. Introduction Overview of signal processing Analog and digital
B. Signals and Frquency Content Power Energy Averaging Phasors Frequency content of signals Audio signals and other examples
C. Signal Conversions Signal converters including ADC and DAC Applications Resolution The Sampling Theorem
I. Signal Processes Over view of signal processing applications Real time Non real time
E. Difference Equations Recursive and non recursive equations
D. Discrete Time Systems Sampled signals Processor selection The design cycle
F. Continuous Time Systems Time and frequency specifications
H. The z-transform Definition of z transform Application to time sequences Transfer functions Poles and zeros Inverse transform
G. Linear Filtering Design of filters Difference equations
J. Differentiation, Prediction & Integration Methods Applications Accuracy
K. Complex Signals Applications of complex signals
L. Spectral Analysis and the Discrete Transform Spectrum of a signal Fourier transforms

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	20.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	This will consist of a mid-year examination.	1,2,3,4,5	20.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	A program of experiments will be carried out based on material covered on the course.. Assignments will be given to the students on aspects of signal processing during the course. A short report will be written and submitted for marking.	1,2,3,4,5	20.00	n/a

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	The students are required to take a written examination at the end of the year.	1,2,3,4,5	60.00	End-of-Semester

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

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	Every Week	1.00
Practicals	Every Week	2.00
Estimated Learner Hours	Every Week	2.00
	Total Hours	5.00