

Module Title:	Signals and Systems 2
Language of Instruction:	English
Credits:	5
NFQ Level:	8
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	Lectures and Laboratory Practicals using software simulation tools
Module Aim:	To introduce the students to the mathematical methods and tools to analyse signals and systems in the time and frequency domains with application to engineering problems
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe an engineering system in mathematical terms.
LO2	Analyse the system and predict its performance
LO3	Simulate the system using appropriate mathematical techniques
LO4	Analyse a system and predict its performance
LO5	Examine a system in terms of stability
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

Linear Time-Invariant Systems

Impulse Representation of Signals; Convolution; Properties of LTI Systems; Causality; Stability; Difference Equations- Block Diagrams

Fourier Analysis

Fourier series applied to Periodic Signals; The Fourier Transform; The Discrete Fourier Transform; Applications

The Laplace Transform

Pole-zero plots, Applications of the Laplace Transform; Region of convergence; The Inverse transform

The z-Transform

Region of convergence; The inverse z-Transform; Geometric evaluation of the z-Transform; Properties of the z-Transform; Transformations between continuous-time and discrete-time systems

Filtering

Ideal filters; Non-ideal filters; Continuous-Time filter; Design techniques; Discrete-Time filter; Design techniques

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
Short Answer Questions	Class tests	1,3,4,5	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 module.	1,3,4,5	20.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Formal Exam at the end of the Semester	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	Every Week	3.00
Laboratory	Every Week	2.00
Independent Learning Time	Every Week	2.00
Total Hours		7.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEBEE_B	Bachelor of Engineering (Honours) in Biomedical Electronics	8	Mandatory
CW_EESYS_B	Bachelor of Engineering (Honours) in Electronic Engineering	8	Mandatory