

Module Specification

Module Summary Information

1	Module Title	Mathematics for Signals and Systems
2	Module Credits	20
3	Module Level	5
4	Module Code	ENG5093

5	Module Overview
<p>Information is the basic thread of life and signals are the medium by which information is passed. This module will focus on classifying and mathematical modelling of signals and systems in the context of Electrical and Biomedical engineering.</p> <p>During the module analytical techniques will be introduced used to transform signals from one domain to another and vice versa. While mathematical techniques will be used and contextualised for actual system hardware.</p> <p>At the end of this module you will be able to determine a systems response and their applications in electronics and Biomedical engineering.</p>	

6	Indicative Content					
<table border="1"> <tr> <td>Euler's identity and Euler's formulae for sine and cosine waves. Euler's formulae for sine and cosine using the Maclaurin and Taylor series.</td> </tr> <tr> <td>Fourier series Fourier Transform</td> </tr> <tr> <td>Laplace transforms. Laplace transforms for circuit and Signal Analysis</td> </tr> <tr> <td>Sampling theory and discrete signals</td> </tr> <tr> <td>Application to basic modulation system</td> </tr> </table>		Euler's identity and Euler's formulae for sine and cosine waves. Euler's formulae for sine and cosine using the Maclaurin and Taylor series.	Fourier series Fourier Transform	Laplace transforms. Laplace transforms for circuit and Signal Analysis	Sampling theory and discrete signals	Application to basic modulation system
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Fourier series Fourier Transform						
Laplace transforms. Laplace transforms for circuit and Signal Analysis						
Sampling theory and discrete signals						
Application to basic modulation system						

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Analyse the properties of continuous time domain periodic signals using Fourier series.
2	Analyse the properties of continuous time domain pulse signals using Fourier transform.
3	Application of analytical mathematics to signal processing.
4	Apply analytical techniques to explore basic modulation schemes such as AM and FM signals.

8 Module Assessment				
Learning Outcome		Coursework	Exam	In-Person
1 - 4		X	X	

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	0
Private Study (PS) includes preparation for exams	152
Total Study Hours:	200