LIVERPOOL JOHN MOORES UNIVERSITY

Signal Processing

Module Information

2022.01, Approved

Summary Information

Module Code	6501ELEMM
Formal Module Title	Signal Processing
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
Auston College Myanmar, Yangon, Myanmar

Learning Methods

Learning Method Type	Hours
Lecture	33
Practical	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
APR-PAR	PAR	April	12 Weeks

Aims and Outcomes

Aims	This module is intended to provide students with a good appreciation of the mathematical concepts necessary to apply digital signal and image processing algorithms to a range of engineering problems.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Characterise analogue and digital systems using appropriate transforms, impulse response and convolution
MLO2	2	Design and implement digital filters
MLO3	3	Process and compress images using appropriate techniques
MLO4	4	Apply DSP to a range of applications

Module Content

Outline Syllabus	Signals and Systems - Foundations, Architecture Requirements and CharacteristicsUse of MATLABFundamentals – Linear Systems, Convolution and Properties of ConvolutionTransforms – Fourier: CTFT, DTFT, DFT, FFT; Laplace and Z-transformsDigital Filters - Basic Concepts Finite Impulse Response filters (FIR) - Design, Fourier Series ApproximationAnalogue Prototypes - Butterworth, Chebyshev, Elliptic; Analogue-To-Analogue TransformsInfinite Impulse Response filters (IIR) - Design, Bilinear, Impulse Invariant TransformsDigital Filters - Implementation, Algorithms & Finite Word EffectsADCs & DACs - Sample and Hold, Antialiasing Multirate Signal Processing – Interpolation and Decimation Time Frequency Analysis – Short term Fourier series, Wavelets, Filter-Banks 2D Signal Processing – Representation of images, image compression, 2D transforms
Module Overview	
Additional Information	This module will provide students with a sound grasp of the theory and applications of modern signal and image processing.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Exam	70	2	MLO1, MLO2, MLO3
Report	Matlab exercises	30	0	MLO1, MLO2, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
David Harvey	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings

Contact Name	Applies to all offerings	Offerings