

Summary Information

Module Code	7316ELEM
Formal Module Title	Advanced Signal Processing
Owning School	Engineering
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	12
Tutorial	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks
SEP_NS-CTY	CTY	September (Non-standard start date)	12 Weeks

Aims and Outcomes

Aims	This module aims to develop an advanced understanding of techniques and practical experience in industry-oriented applications of digital signal processing.
------	--

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Demonstrate advanced understanding of the concepts and analytical tools for DSP systems
MLO2	2	Design and implement a range of complex digital filters
MLO3	3	Apply high level techniques for a stochastic signal
MLO4	4	Use DSP to implement a range of complex engineering applications

Module Content

Outline Syllabus	Digital Signal Processing (DSP) and Systems – Fundamentals, Architectures and Characteristics Analysis Tools and Transforms – Fourier: CTFT, DTFT, DFT, FFT; Laplace and Z-transforms Digital Filters: Design and Implementation – FIR, Analogue Prototypes, IIR, Algorithms Stochastic signal processing, Random Processes, Spectrum, PSD, white noise DSP Implementations: Multirate Signal Processing – Sampling, Aliasing, Interpolation and Decimation Speech Processing – LPC, Synthesis, Coding and Recognition A/D and D/A Conversions – Quantization, Sample and Hold, Antialiasing, Acquisition Digital Communication – Digital modulation, Multiplexing, Noise Modulation – MIMO, OFDM, Wavelets, Data Transmission – bandwidth, Coding, Entropy, Errors Radio Frequency - Signal Conditioning, Down and Up Conversions, Detection, DDC, NCO, CIC Filter, Sparse Antenna Array Design - Factorization Approach, Aperture Functions
Module Overview	
Additional Information	This module aims to develop an advanced understanding of techniques and practical experience in industry-oriented applications of digital signal processing.

Assessments

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

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Gerard Edwards	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings

