

Liverpool John Moores University

Title: DIGITAL SIGNAL PROCESSING
Status: Definitive
Code: **6026ENG** (106366)
Version Start Date: 01-08-2011

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Munther Gdeisat	Y

Academic Level: FHEQ6 **Credit Value:** 12.00 **Total Delivered Hours:** 50.00
Total Learning Hours: 120 **Private Study:** 70

Delivery Options

Course typically offered: Summer

Component	Contact Hours
Lecture	24.000
Practical	12.000
Tutorial	12.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	50.0	2.00
Report	AS2	Coursework: MATLAB assignment	50.0	

Aims

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

Learning Outcomes

After completing the module the student should be able to:

- 1 Specify and design DSP Systems
- 2 Design FIR Filters
- 3 Design IIR Filters
- 4 Solve DSP problems and estimate spectra using appropriate transforms.
- 5 Apply DSP to a range of applications.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5
MAtlab assignment	2	3			

Outline Syllabus

*Architecture requirements of DSPs,
Use of MATLAB & SIMULINK*

FIR filter design: The choice of windows: fixed form v. adaptable form, Design of optimal filters

IIR filter design: analogue prototypes: Butterworth, Chebyshev, Elliptic. Bilinear transform.

Use of transforms in one of two dimensions: Fourier, Laplace, Z, Discrete Cosine Transform.

Non-parametric methods of spectral estimation, bias, resolution, Wavelets.

DSP systems applied to speech and image processing.

Learning Activities

A series of lectures and tutorials with some laboratory activity using MATLAB.

References

Course Material	Book
Author	Ifeacher E.C., Jervis B.W.
Publishing Year	2002
Title	Digital Signal Processing: A practical Approach
Subtitle	
Edition	2nd
Publisher	Addison-Wesley
ISBN	0 201 59619-9

Course Material	Book
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Author	Mitra, S.K
Publishing Year	2006
Title	Digital Signal Processing :A Computer-Based Approach
Subtitle	
Edition	3rd
Publisher	McGraw-Hill International Editions
ISBN	9780073048376

Course Material	Book
Author	Oppenheim A.V., Buck J. R.
Publishing Year	2010
Title	Discrete-Time Signal Processing
Subtitle	
Edition	3rd Ed
Publisher	Prentice Hall
ISBN	9780131988422

Notes

This module builds on the level two module in maths, signal processing and simulation to provide an extensive knowledge of Digital Signal Processing.