UNIVERSITY OF SALFORD FORM MS (2013/14)

MODULE SPECIFICATION

Please contact your College Learning and Teaching Team for guidance completing this form:
Colleges of Arts & Social Sciences and of Business & Law – cass-tandlteam@salford.ac.uk
College of Health and Social Care – chsc-teaching@salford.ac.uk
College of Science and Technology – cst-tl@salford.ac.uk

This form is available to download from http://www.governance.salford.ac.uk/page/aqa_forms).

Date of completion of this version of Module Specification: 12/01/2016

Date of approval by the CPPARC: 26/01/2016

1. Module Title: (Full title and short title no more than 30 characters)	2.CRN:
Digital Signal Processing	39014 (S4)

3.University module code:	4.HESA/JACS subject area code[i]:
J930 20033	J930

5.Level:	6.Credit Value:	7.ECTS Value[ii]:	8.Length of module in semesters:	9.Month(s) in which to be offered[iii]:
Level 5	20	10	2	September

10.Module Status[iv]	11.Title of Module being replaced *(if any):*	12.With effect from[v] (academic year):
Existing	Digital Audio	September 2016/17

13.Originating School:	14.Module Leader(s)
School of Computing, Science & Engineering	Jamie Angus

15.Programme(s) in which to be offered[vi]:

BEng (Hons) Audio Acoustics: Acoustic Engineering
BEng (Hons) Audio Acoustics: Audio Engineering
BEng (Hons) Electronic Engineering
BSc (Hons) Physics with Acoustics
BSc (Hons) Physics with Acoustics with Professional Experience
MPhys (Hons Physics with Acoustics
MPhys (Hons) Physics with Acoustics with Professional Experience

16.Pre-requisites *(between levels):* None	17.Co-requisites *(within a level):* None

18.Indicative learning hours (breakdown of hours required)[vii] 200

Lecture	44	Fieldwork	
Seminar		External visits	
Tutorial		Work based learning	
Project supervision		Guided independent study	112
Demonstration Practical classes and workshops	44	Placement	
Supervised time in studio/workshop		Year abroad	
Other – please specify[viii]			

19.Percentage of module taught by School(s) other than originating School: None

20.Aims of Module[ix]: (maximum of 5)

- To introduce the concepts and principles of digital analogue signals and analogue signal processing.

- To introduce and develop the knowledge and skills needed to design, program and implement analogue signal processing applications.
- To develop project management, research and written communication skills.

21.Intended Learning Outcomes[x]

Knowledge and Understanding (maximum of 5)[xi]
On successful completion the student will be able to:

1. Demonstrate the basic principles behind Digital Analogue Signals, e.g. Sampling, Aliasing, Quantisation and Dither.
2. Demonstrate the underlying principles behind Digital Analogue Signal processing, e.g. impulse response, frequency response and convolution.
3. Demonstrate knowledge of transforming between time and frequency via the Fourier Transform.
4. Be able to a design a Window based Low-Pass FIR filter.
5. Understand the difference between IIR and FIR filters.
6. Be able to implement signal processing tasks in MATLAB.

Transferable/Key Skills and other attributes (maximum of 5)
On completion the student will have had the opportunity to:

7. Application of Number: manipulation of equations
8. Communication: Production of a written Conference paper to a house standard
9. Information Technology: Programming and application of MATLAB to Signal Processing
10. Managing Learning: Additional research needed for assignment and project Management
11. Problem Solving: Applying the techniques learnt to the assignment

22. Module mark calculation: Method A

23.Assessment components (in chronological order of submission/examination date)
Denote final assessment component in box marked **final assessment component (99)**

Type of assessment	Identify which ILO is met by number[xii]	Weighting %	Duration	Word count	Component pass required[xiii]	E Submission	Assessment organised by
Examination	1,2,3,4,5,7, 11	50	2 Hours	n/a	No	No	SID
					Choose an item.	Choose an item.	Choose an item.
Final assessment component (99) Production of an Analgoue Signal processing Application in Matlab with Conference Paper.	**1,2,3,4,5,6, 8,9,10**	50	n/a	Page count = 10 pages	No	No	School

24. Is ethical approval for the module required?	No	25. Is ethical approval for an assessment component required?[xiv]	No

26.Learning, teaching and assessment strategies:

Lectures,
Combined lecture/workshop sessions in the computer laboratories.

27.Syllabus outline:

- Introduction to digital signals in acoustics and audio: Sampling, Aliasing, Quantisation, and Dither.
- Noise shaping and Oversampling, Application to Analogue Audio to Digital Conversion.
- The continuous Fourier Transform Pair, Discrete and Fast Fourier Transforms
- Filters: Impulse responses, Frequency responses, and the Convolution Theorem.
- Digital filters: Discrete convolution, and the FIR filter
- FIR Filter design, Windowing , Fast Convolution, IIR Filter principles
- Applications of FIR and IIR digital filters, e.g. reverberators and audio equalisers.

Sample rate conversion using FIR filters, with application to Audio conversion.

28.Indicative texts and/or other learning materials/resources[xv]:

A comprehensive reading list can be accessed at http://lasu.salford.ac.uk

For Office Use only:

Teaching and Learning Team Comments:	Module spec brought as part of Physics PPRR on 26 Jan 2016.

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i See UoS guidance notes on selecting JACS codes (http://www.planning.salford.ac.uk/jacs_codes/)
see HESA JACS Codes webpage http://www.hesa.ac.uk/index.php/content/view/356/233/

ii The ECTS value is half of the module credit value

iii Please indicate the month (s) in which delivery of the module will commence.

iv Amendments to the title or credit value constitute a new module.

v If the delivery month of the module is to be available for different intakes of a programme, please indicate this here. E.g. Module effective from Sept 2014 – to state the module is to be available for Sept 2014 intake & Feb 2014 intake.

vi The module will only be attached to programmes specified in this section. Any approved module can be available as a stand-alone module.

vii These categories are used for the Key Information Set which currently applies only to full time undergraduate students only but please include for all students – for more information including definitions see http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/contact_hours.pdf and http://www.hesa.ac.uk/component/option,com_studrec/task,show_file/Itemid,233/mnl,13061/href,Calculations_methods.html/#LearningandTeaching

viii The 'other' category should not be used for learning undertaken by full undergraduate students as 'other' is not used in KIS categories

ix The aims should express the purpose of the module.

x The intended learning outcomes should detail the knowledge, understanding and skills that students will be able to demonstrate on successful completion.

xi In some circumstances it may be necessary to have more than 5 intended learning outcomes. You will be asked to provide your rationale for this in discussion at the CPPARC.

xii For example, if the assessment is an essay and the essay meets ILOs number 1-4 and 6-7, state 1-4,6-7

xiii If Method B is used for module mark calculation, indicate Yes to specify the assessment component(s) to be passed in order to pass the module

xiv Please specify component(s) for which ethical approval is required.

xv The "Indicative texts and/or learning materials/resources" box should include a maximum of 5 items for new modules; for existing modules the box should just include a link for CPPARC reviewers and readers to the comprehensive reading list at http://lasu.salford.ac.uk