

Liverpool John Moores University

Title: Digital Audio Applications
Status: Definitive
Code: **5531STE** (124038)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Liverpool Institute for Performing Arts

Team	Leader
Karl Jones	

Academic Level: FHEQ5
Credit Value: 20
Total Delivered Hours: 51.5
Total Learning Hours: 200
Private Study: 148.5

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	20
Workshop	30

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Presentation	Pres	Demonstration of DSP Designs	50	
Exam	Exam	Written Exam 1.5 hours	50	1.5

Aims

To provide students with a clear understanding of the essential theory associated with digital audio systems and their implementation To apply digital signal processing theory in the development of practical audio tools.

Learning Outcomes

After completing the module the student should be able to:

- 1 Apply digital signal processing theory in the design of practical audio tools
- 2 Explain the underlying theory and practice associated with digital audio conversion and transmission
- 3 Evaluate a range of techniques employed in data compression for audio

Learning Outcomes of Assessments

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

Demonstration	1	2
Written Exam	2	3

Outline Syllabus

Digital Audio Signal Path

A/D converter topologies – advantages and disadvantages of individual approaches. Clock function and distribution; dithering function and options; compatibility issues; digital audio transmission standards – AES/EBU, SP-DIF, T-DIF, MADI; metering considerations. Quality considerations in digital systems – jitter, PLL stability

Digital Audio Networking

Networking basics; OSI model; switching and routing; Layer 1, 2 and 3 approaches and standards; circuit switched vs packet switched approaches

Digital Signal Processing

Digital filter implementation. Convolution. Reaktor software as an audio processing development tool. Design of digital audio processing tools in Reaktor – EQ, dynamics, surround panning.

Data Compression

Information theory and notions of redundancy; lossless compression – Huffman, LZW; lossy compression precepts; architecture and operation of MPEG 1, MPEG2 and AAC audio codecs; compression artefacts and what to listen for; objectively evaluating codec performance

Learning Activities

This module will be delivered using the following teaching and learning strategies:
Lectures to introduce key concepts and theories
Workshops to apply these concepts using appropriate software and hardware
Individual study in line with guidance and direction from tutors
Student presentation and demonstration of coursework to tutor

Notes

Jon Thornton is the Module Leader