Module Specification

Module Summary Information

1	Module Title	Audio Systems
2	Module Credits	20
3	Module Level	5
4	Module Code	DIG5118

5	Module Overview

This module will develop key understanding of audio systems, embedded systems and electronics. This module will encourage you to develop your passion for the equipment found in the studios, how they sound and why, and what makes them important during the recording, mixing and mastering process.

Audio Systems builds upon previous knowledge gained in Audio Electronics yet aims to increase applied understanding of sound engineering concepts in a practical and theoretical manner. This module has an emphasis upon practical design and provides an introduction to audio software development in the C++ programming language. Whilst technical, the module aims to provide useful, relevant information that should encourage you to a path of further study and possible final year design projects.

The module will be taught using elements of classroom and flipped learning sessions through the development of an audio artefact encompassing knowledge required by self-study, construction and testing.

6	Indicative Content

Studio (analogue) audio application

Consoles and separates:
Topology, Balanced lines (DI boxes), Microphone pre-amplifiers. Busses, Mixers, Crosstalk, Faders. Equalisation, digital consoles, headphone amplifiers.

Compressors:
VCA, FET, OTA, Optical, tube, Dynamic Range (DRC), Peak reduction.

Patch-bay wiring:
Configurations, cables, connectors (TRS, RCA, XLR, TS).

Studio Electrics (Power Systems):
Commercial supplies (3-phase) and domestic power. Influence of power supply on audio systems, UPS, Earthing, power conditioners.

Embedded audio application

Digital audio interfacing:
USB, Firewire, MIDI

MIDI:
Serial vs Parallel Communication, Packets, Data Structure and Events.
General MIDI, Core MIDI, MIDI Networks.
Circuit Isolating and Hardware protection. MIDI Networks

Embedded Software Design in C++:
Pre-Language Software Design Techniques, SDKs and IDE's, Hardware specific protocols, Input / Output of Hardware.
Arduino Programming Protocols, Analogue vs Digital Input, Digital Output, Functions.
Logic, Decision Making, Loops and Arrays.

7	Module Learning Outcomes
	On successful completion of the module, students will be able to:
1	Describe function and application of audio equipment.
2	Assess and analyse performance of audio hardware design topologies at component level.
3	Apply fundamentals of computer programming to a simple audio embedded system within laboratory sessions.
4	Design, construct and evaluate a basic audio embedded system reporting findings in an appropriate format.

8	Module Assessment		
Learning Outcome			
	Coursework	**Exam**	**In-Person**
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	**Hours**	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	30	
Private Study (PS) includes preparation for exams	122	
Total Study Hours:	200	