Module Definition Form (MDF)

Module code: MOD008116	**Version:** 2 **Date Amended:** 27/Jul/2021

1. Module Title
Advanced Audio Technology

2a. Module Leader
William Campbell

2b. School
Cambridge School of the Creative Industries

2c. Faculty
Faculty of Arts, Humanities, Education and Social Sciences

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
45

4b. Study Hours
450

5. Restrictions			
Type	**Module Code**	**Module Name**	**Condition**
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BSc (Hons) Audio and Music Technology BSc (Hons) Audio and Music Technology [with Placement year] BSc (Hons) Audio and Music Technology [with Foundation Year] BA (Hons) Music and Sound Production		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

In this module you will look in more detail at the theory and practice of a variety of audio scenarios.

You will learn more about digital audio theory, including oversampling, dither, common digital signal processing (DSP) techniques and file/media formats. You will also examine the Musical Instrument Digital Interface (MIDI) standard, sound synthesis techniques, and Audio over Ethernet systems.

On the studio side, you will move beyond the native mixers/processors/plugins in commercial DAWs, towards higher-quality external processors such as DSP-based plugins and analogue outboard. You will experiment on noise floor, harmonic distortion and intermodulation distortion, and investigate advanced use of delays and reverberation to create space and depth. You will learn critical listening to show the value of advanced recording/mixing tools, and design experiments analysing specific devices and processors.

You will develop recording skills for a wide range of live performances, and look into the psychoacoustics of spatial perception. Microphone configurations are examined using practical recording/playback experiments. You will make a recording of your choice and give a presentation on the acoustic challenges and the techniques used to address these.

Creative industries demand bespoke complex integrations of many technologies, and you will examine the design of such systems. This involves knowledge of room acoustic design, sound isolation, absorption/diffusion/abfusion, playback and capture system specifications, signal flow, and noise attenuation/avoidance. You will gain working knowledge applicable to multiple areas of industry, specifying hardware, software and infrastructure that meet a design brief.

6b. Outline Content

- Digital audio, Nyquist theory, sampling, editing, oversampling, dither
- File and media formats
- Sound synthesis algorithms
- Critical and analytical listening, appreciation of quality
- Advanced recording and mixing techniques
- Processors, high-quality analogue devices, and high-quality DSP based devices
- Experiment design for quantitative and qualitative analysis
- Creation of space and depth in recordings and mixes
- Capacitor/Dynamic/Ribbon microphones
- The theory of stereo sound
- Microphone arrays for stereo recording
- Psychoacoustic factors influencing stereo perception
- Introduction to system design principles, feature mapping and optimisation
- Acoustic, ergonomic, aesthetic, mechanical and electrical considerations
- Objective measurements for audio systems
- Critical subjective evaluation principles

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Recording studio

AV lab

Electronics laboratory

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Evaluate the key electronic technologies used for representing audio and score-based musical data.
2	Knowledge and Understanding	Select suitable microphones and their arrays for stereo recording of different types of live performance.
3	Knowledge and Understanding	Demonstrate how analogue electronic devices are used in combination with analogue and digital mixers.
4	Knowledge and Understanding	Demonstrate knowledge of audio technologies and a working knowledge of their integration in audio system design.
5	Intellectual, practical, affective and transferrable skills	Perform processing techniques to enhance stereo imaging on audio recordings.
6	Intellectual, practical, affective and transferrable skills	Make recordings of a wide variety of sounds/performances using a range of equipment.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	80	1-4; 2-6	Lectures: LO 1-4 - Tri 1: 2-hour lecture in weeks 1-6 and 8-11; Tri 2: 2-hour lecture in weeks 1-6 and 8-11. Practical: LO 2-6 - Tri 1: 2-hour practical in a studio in weeks 1-6 and 8-11; Tri 2: 2-hour practical in a studio in weeks 1-6 and 8-11.
Other teacher managed learning	20	2,5,6	Tri1: 4-hour feedback session in week 7; Tri1: 6-hour presentation session in week 12. Tri2: 4-hour feedback session in week 7; Tri2: 6-hour presentation session in week 12.
Student managed learning	350	2,3,5,6	Coursework.
TOTAL:	450		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1,3	30 (%)	Fine Grade	30 (%)
Logbook plus audio, 2,000 words equivalent due at end of Tri 1					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Coursework	4	30 (%)	Fine Grade	30 (%)
Logbook plus audio, 2,000 words equivalent due at end of Tri 2					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
012	Coursework	1-6	40 (%)	Fine Grade	30 (%)
Written report plus audio, 3,000 words equivalent due at end of Tri 2					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]