



MODULE SPECIFICATION

Part 1: Information			
Module Title	Audio Process Design and Implementation		
Module Code	UFCFE4-30-2	Level	Level 5
For implementation from	2021-22		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description
<p>Overview: This module combines signal processing and plugin development. Students will learn how audio processes work and how to develop audio effects and synthesisers in C++, which can run in any DAW.</p> <p>This is a challenging coding module which will help students develop a technical understanding that open doors to many opportunities in both the music and software industry. There are also many ways to develop software for musical creativity; many popular and groundbreaking tracks are defined by their innovative use of technology to create new sounds and push what is possible with off-the-shelf technology.</p> <p>Educational Aims: See Learning Outcomes</p> <p>Outline Syllabus: The syllabus includes:</p> <p>Analysis of output characteristics of common musical instruments. Analysis of signal and structural characteristics of audio processes.</p>

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Design and implementation of modification and synthesis processes in detail, such as common studio effects, traditional and modern synthesis methods, and custom solutions to specific sonic requirements.

Relationships between written specifications, block diagrams, implementation techniques, and aural effects.

Object oriented design and implementation in the context of audio software.

Programming language syntax, libraries and tools. Data structures, algorithms, and architectures applied to audio processes.

Appropriate mathematical methods including functions for mapping and conversions, methods of processing discrete sampled values, lookup tables and generating signals.

Teaching and Learning Methods: Discussion sessions and self-paced learning materials will enable students to acquire knowledge of the theoretical and conceptual aspects of audio process design and implementation, and an understanding of the application of theory to practical problems.

Supervised practical classes will be used to develop student understanding of the realisation of designs in software, the relationship between engineering forms and perceptual effects, and to acquire skills concerning software development and the use of the supporting software packages. As well as the practical sessions further efforts in finishing tasks, extending ideas, and development of knowledge will be required.

Support will also be provided via email and virtual learning environments.

The assignments will draw on the above approaches, but will require additional unsupervised learning to design, implement and debug audio processes in software which are more extended than those seen in the practicals. Efforts will typically increase from a low base at the start toward a maximum at the completion of assessment stages, rather than being evenly distributed.

Contact Hours:

Activity:

Contact time: 72 hours

Assimilation and development of knowledge: 148 hours

Exam preparation: 20 hours

Coursework preparation: 60 hours

Total study time: 300 hours

Part 3: Assessment

The individual presentation and oral assessment will be used to establish students' understanding of the theory and implementation of processes described in lectures and reading materials. To achieve marks beyond a threshold level, a wider appreciation of the design, implementation and uses of audio processes in context beyond the taught examples will be necessary.

The assignments will be used to establish students' understanding of practical design and implementation of software audio processes. This will involve demonstrating an ability to create two extended pieces of work, the first in a group, the second individual, beyond the examples seen in lectures and practicals. The resit assignment is an individual piece of work that combines elements of the first two assignments. The assignments will be spaced in such a way as to maintain motivation through the module, and staged to allow progressive development of skills and understanding.

Formative assessment will be provided as part of the practical sessions. Group and individual feedback will be provided for the first and second assignments respectively. Cohort-wide feedback will be provided for the exam.

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Marking of group assignment will include an opportunity for students to indicate individual contributions. Assessment criteria will be supplied with the assignment specification and in the presentation brief.			
First Sit Components	Final Assessment	Element weighting	Description
Presentation - Component A	✓	25 %	Individual Presentation (10 mins) with oral assessment
Project - Component B		45 %	Process design and software development assignment 2 (Individual)
Project - Component B		30 %	Process design and software development assignment 1 (Group)
Resit Components	Final Assessment	Element weighting	Description
Presentation - Component A	✓	25 %	Individual presentation (10 mins) with oral assessment
Project - Component B		75 %	Process design and software development assignment (Individual)

Part 4: Teaching and Learning Methods

Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:	
	Module Learning Outcomes	Reference
	Identify, describe, compare, select, modify, and combine audio modification, synthesis and control methods of all common types to construct theoretical solutions to problems using low-level elements, with regard to artistic and scientific requirements.	MO1
	Convert between written specification, block diagram, and implementation forms of audio processes.	MO2
	Identify and describe the perceptual, time and frequency domain effects of audio processes.	MO3
	Select, combine, extend, implement and configure a specific subset of audio modification, synthesis and control methods in depth to achieve operational solutions to problems using low-level elements, with regard to artistic and scientific requirements.	MO4
	Design, implement, test, debug and evaluate object oriented software in an audio context.	MO5
Contact Hours	Independent Study Hours:	
	Independent study/self-guided study	228
	Total Independent Study Hours:	228
	Scheduled Learning and Teaching Hours:	

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	Face-to-face learning	72
	Total Scheduled Learning and Teaching Hours:	72
	Hours to be allocated	300
	Allocated Hours	300
Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ufcfe4-30-2.html</p>	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Audio and Music Technology [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21

Audio and Music Technology [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Audio and Music Technology {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2019-20

Broadcast Audio and Music Technology {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2019-20

Broadcast Audio and Music Technology {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Audio and Music Technology {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Creative Music Technology [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Creative Music Technology [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21