

Computer Audio Technology

Module Information

2022.01, Approved

Summary Information

Module Code	4200AMP
Formal Module Title	Computer Audio Technology
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	22
Tutorial	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To explain how computers capture, process and store digital audio and performance data and explore the systems used to enable this. To illustrate the hardware and software that is used in computer-based audio and music production. To explore the techniques used to edit and manipulate digital audio and musical performance data. To utilise the various activities and skills required during the typical workflow stages of computer-based audio production.
------	---

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Recognise and define the primary components of a computer-based audio production environment.
MLO2	2	Define the techniques used for manipulating both digital audio signals and digital performance data and formulate an appropriate workflow to enable this manipulation to take place.
MLO3	3	Examine the practical role of audio hardware and software components in computer-based DAWs.
MLO4	4	Demonstrate a range of audio editing and production techniques to develop custom audio solutions.

Module Content

Outline Syllabus	The physical properties of sound Number bases, audio and computing architectures Computer audio technology: interfaces and I/O The workflow of computer audio production Introduction to Pure Data: programming audio applications Digital Audio Workstations (DAWs) Sampling theory and practice: Analogue to digital conversion Digital to analogue conversion Digital audio editing techniques Understanding and analysing audio: deconstruction Fundamentals of sound synthesis; ADSR envelopes, LFOs, additive synthesis, AM and FM synthesis Subtractive synthesis and wavetables The MIDI protocol, MIDI devices and control Sequencing and MIDI programming Digital Signal Processing (DSP), effects and filters Plug-ins and virtual instrument technologies Advanced digital audio editing techniques Spectrum analysis and audio visualisation Multichannel audio and surround sound placement Time codes and synchronisation Intermediate audio programming concepts in Pd Developing a complete virtual instrument with Pd
Module Overview	
Additional Information	This module investigates how computers capture, process and store digital audio data. This can include sampled sound and performance data in the form of MIDI. Some introductory audio programming skills are developed during the module to allow students to process audio data with computer software. Practical experience of using DAW systems to create audio projects is provided.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Examination	50	2	MLO3, MLO2, MLO1
Practice	Production of an audio book	50	0	MLO4, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Martin Hanneghan	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
--------------	--------------------------	-----------