

MODULE SPECIFICATION FORM

Module Title: Computer Music Programming	Level: 5	Credit Value: 20
---	----------	------------------

Module code: CMT205	Semester(s) in which to be offered: 2	With effect from: Sept 10
---------------------	---------------------------------------	---------------------------

Existing/New: Existing	Title of module being replaced (if any): N/A
------------------------	--

Originating Subject: Creative industries	Module Leader: M.Wright
--	-------------------------

Module duration (contact hours/directed private study): 200Hrs 60C 140Dps	Status: core/option/elective (identify programme where appropriate): Core - BSc Music Technology Elective Module
---	---

Percentage taught by Subjects other than originating Subject (please name other Subjects): None

Programme(s) in which to be offered: BSc (Hons) Music Technology	Pre-requisites per programme (between levels): none	Co-requisites per programme (within a level): None
---	--	---

<p>Module Aims:</p> <p>This module will enhance and develop the skill set and theories developed at level four. Concepts of computer music programming will be investigated. The student will develop a knowledge of musical structures created by computer applications and will be capable of applying music computation software.</p> <p>The student will investigate novel methods of sound production and gain an awareness of modern music developments.</p>
--

<p>Expected Learning Outcomes</p> <p>Knowledge and Understanding:</p> <p>On completion of this module the student should be able to:</p>
--

1. demonstrate detailed knowledge to enable sound processing by application of audio software.
2. creatively develop specific audio applications to enable VST (Virtual Studio Technologies).
3. Evaluate and utilise appropriate techniques to develop synthesis algorithms.

Transferable/Key Skills and other attributes:

Communicate effectively, use ICT systems to present information.

Utilise problem-solving skills for theoretical and practical situations.

Assessment: please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%). **Details of indicative assessment should also be included.**

Typical assessment could include examples from these listed below.

Design and develop a 'plugin' using the modules of a typical subtractive synthesiser construct signal flow diagrams to show how the following might be produced. Include information about wave-shapes, frequencies, levels and distinguish clearly between signal paths, control paths and gate paths.

Create an algorithmic MIDI sequence based on two of the following:-

Lorentz sequence $x(n+1)=a(3x(n)-4x(n)^3)$

Earthworm sequence

Henon

Morse-Thue sequence

1/f noise

Gingerbread man

Martin

Random

3n+1 numbers

Logistic map

Hop-a-long

Wolfram one-dimension Cellular Automata

Production of sequence and algorithms to satisfy a rule based system.

Use reaktor to construct a module that will develop rule based systems

Consider the use of Finite state sets to enable a reactor process to implement audio.

Develop a Markov chain structure to enable music production.

The rules are to be defined by the composer/software developer.

Consideration to be made as to why structures are chosen and the influences that decide on structure, these can be based on western composition, esoteric choice of progression, non-standard use of scales etc.

Describe and include examples for the methods employed for the following computer sound synthesis techniques

Wave-table synthesis

Walsh synthesis

Granular Synthesis.

Assessment number	Type of assessment	Weighting	Duration (if exam)	Word count (if coursework)
-------------------	--------------------	-----------	--------------------	----------------------------

Assessment One:	Portfolio comprising software, technical exercises, investigative report	100%	N/A	Compilation of software programmes
-----------------	--	------	-----	------------------------------------

Learning and Teaching Strategies:

The module will be delivered by a series of interactive classes augmented by self-learning exercises and tutorials. Computer packages will be utilised where appropriate.

Syllabus outline:

Context of computer-based music:

Historical background of computer production technologies, including music I,II,III,IV. Music languages, music editors, performance software.

Analysis of software programs: relate to other programmes used in the course, such as Walsh development, and Granular development.

Algorithmic production: Representations and strategies for algorithmic production for generation of differing types of sound processing, such as filters, (high-pass low-pass notch band-pass) amplification methods, waveform generation.

Programming language:

types and themes, the basic elements of programming languages;

Sound in the environment:

spatialization and reverberation.

Synthesis programming techniques:

Waveform segments, graphic and stochastic synthesis.

Bibliography

Essential Reading:

The Computer Music Journal

Journal of the Audio Engineering Society

Journal of Organised Sound

Recommended Reading:

Roads, C. Strawn, J. (1998) Foundations of Computer Music. MIT Press,

Miranda, E. (1998) Computer Sound Synthesis for the Electronic Musician. Focal Press

Miranda, E. (2002) Computer Sound Design: Synthesis techniques and programming: Synthesis, Techniques and Programming. Focal Press

Roads C; The Computer Music Tutorial; (MIT Press, 1996)

www.harmony-central.com/Computer/

www.computermusic.org/International *Computer Music Association*

www.mitpressjournals.org/cmj

www.futuremusic.co.uk/