6.10 Module 10: Music Technology 2

Module Title	Music Technology 2
Module NFQ Level (only if an NFQ level can be demonstrated)	7
Module number/Reference	BAAMT201
Parent Programme	BA (Hons) in Audio and Music Technology
Stage of Parent Programme	2
Semester	1 and 2
Module Credit Units (FET/HET/ECTS)	ECTS
Module Credit number of Units	10
List the teaching and learning modes	FT
Entry requirements (statement of knowledge, skill and competence)	Learner has earned Level 5 qualification. No previous music technology ability is required
Pre-requisite module titles	No
Co-requisite module titles	No
Is this a capstone module? (Yes or No)	No
Staff qualifications (academic, pedagogical and professional/occupational) and experience required. (staff includes workplace personnel who are responsible for learners such as apprentices, trainees and learners in clinical placements)	Staff are required to have at least a Bachelor of Arts (Honours) qualification in Music Technology or related discipline. Industry experience would be a benefit but is not a requirement. Staff are expected to have the Certificate in Training and Education qualification from Griffith College or its equivalent.
Staff/learner ratio per centre (or instance of the module)	For lecture load, ratio of 1:50 lecturer to learner is required and in lab sessions the maximum allowed is 1:25 The lecturer will also have 1 hour per week set aside in their timetable for 1:1 contact with learners who require it or have particular items they want to discuss.
Maximum number of learners per centre (or instance of the module)	50
Duration of the Module	Two Academic Semesters, 24 weeks teaching
Average (over the duration of the module) of the contact hours per week.	3
Physical resources and support required per centre (or instance of the module)	One lecture hall with capacity at least 50 and one computer lab with capacity of 25.

Analysis of Required Learning Effort										
Effort while in contact with staff										
Classroom and Demonstrations		Mentoring and small group tutoring		Other (Specify)		Directed e-learning (hours)	Independent learning (hours)	Other hours (specify)	Work-based learning hours of learning effort	Total Effort (hours)
Hours	Minimum ratio teacher/learner	Hours	Minimum ratio teacher/learner	Hours	Minimum ratio teacher/learner					
48	1:50	24	1:12				178			250
Allocation of marks (within the module)										
				Continuous Assessment	Supervised Project	Proctored practical	Proctored Written Examination	Total		
Percentage contribution					70%	30%		100%		

6.10.1 Module Aims and Objectives

This module aims to develop the learner's ability to use the MIDI protocol through advanced editing techniques within Software MIDI systems. Learners develop their knowledge of synthesis via further study of alternative synthesis methods (Additive, Granular, Frequency Modulation, Physical modelling), and further their knowledge of sampling via sampler scripting within advanced sampler frameworks. Learners explore rhythm, polyrhythm and polymeter and the essential techniques and principles of effective drum programming. Essential and established techniques and practices will be underpinned by a survey of creative practitioners and their work within this area.

6.10.2 Minimum Intended Module Learning Outcomes

On successful completion of this module the learner will be able to:

MLO 10.1   Illustrate advanced Synthesis Methods.
MLO 10.2   Demonstrate an understanding of an advanced Sampler framework and the creation of sophisticated Sample Patches.
MLO 10.3   Employ MIDI Editing techniques to an advanced level.
MLO 10.4   Use drum programming to a professional standard.
MLO 10.5   Complete sophisticated research both individually and within a group into specialist topics and present in a class situation the findings, insights, concepts and techniques involved.

6.10.3 Rationale for inclusion of the module in the programme and its contribution to the overall IPLOs

As technology progresses, the functionality and practicality of computer based music software has expanded. This module will expand on the fundamentals of music technology and help develop a more creative and thorough skillset. The learning outcomes of this module relate and contribute particularly to the learner's attainment of Programme Learning Outcomes 3 and 7. The learning here is also essential as preliminary to achieving Programme Learning Outcome 4 and 5.

6.10.4 Information Provided to Learners about the Module

Learners enrolled on this module will receive a copy of the module descriptor and assignment briefs, including an outline of the criteria for assessment.

Previous examples of assignments are also presented to the class.

6.10.5 Module Content, Organisation and Structure

The module is organised to deliver theory through lectures (2 hours) and supervised tutorials (1 hour). During tutorials, learners will work individually on computer workstations. This will allow the lecturer to work with smaller groups to demonstrate the material.

The lectures each week will combine lecture delivery and discussion on the material.

Each lecturer has a time allocated for one-to-one meetings with learners as required. These are not mandatory sessions but available either where the lecturer wishes to discuss an element of the module with a learner, or a learner requests a meeting to discuss a particular topic. These sessions focus on academic issues only.

Module Content

Further Synthesis Methods
- An understanding of the components of an FM synthesizer, Physical-modelling synthesizer, Additive synthesizer, Granular Synthesizer.
- The signal flow and routing between these components.
- The ability to create sounds from an initialized patch within each synthesizer.
- An understanding of the Synthesis Concepts underpinning each synthesizer.

Advanced Sampler framework and the creation of sophisticated Sample Patches
- Creation of Multi-layered Sample patches using the Round Robin and neighbour borrowing approaches.
- The setup and correct use of Key switching for larger patches utilizing the ability to switch performance articulations.
- Creation of Velocity layered sample patches, which respond to MIDI CC's for sample switching/velocity cross fading.

Advanced MIDI Editing techniques
- The set up and correct use of MIDI input filters.
- The correct use of the MIDI Event list for midi editing and selection.
- The correct and effective use of the "separate events via" commands.
- The MIDI environment and the set-up of system.
- Correct use of and creation of MIDI transform operations.
- Basic scripting of Meta events.

Drum Programming
- How to create rhythmic material.
- The effective layering of samples/sound**s.**
- How to synthesise percussive sounds from synthesizers.
- Tempo, meter, pastiche rhythms/patterns and rhythm instrumentation for modern musical styles.
- Rhythmic simple sub-divisions (crotchet, quaver, etc.), and more complex rhythmic subdivisions. (Triplets, Tuplets, swing/shuffle).

6.10.6 Module Teaching and Learning Strategy

This module is delivered through a combination of lectures, tutorials. These tutorials will focus on the practical skills required when using synthesizers and samplers while also demonstrating advanced MIDI editing techniques and allowing the development of drum programming skills. These skills will take time to develop. While learners may get to grips with the technical requirements, the creative and/or musical skills takes time to develop.

Activity	Teaching / Learning Strategy	Learning Environment
Lectures (48 hours)	Lectures / participative discussions / case studies of application of techniques in professional studio workflows / demonstrations of advanced synthesizer and MIDI principles / flipped Classroom discussion and engagement	College
Tutorial (24 hours)	Training in use music technology equipment / practical work linking theory and practice / use of small editing suites, recording studios and computer labs	College / Mac lab
Assignment (96 hours)	Practice learning and perfecting music technology skills	College
Independent Work (82 hours)	Directed and self-directed learning / home study	College / Home
Examination (3 hours)	Evaluation of knowledge and related skills	College

6.10.7 Timetabling, Learner Effort and Credit

The module is timetabled as one 3-hour session to the whole class. This will consist of a 2-hour lecture, and a 1-hour tutorial with Music Tech workstations. On the workstations the learners engage directly with samplers, synthesizers, MIDI editors and drum programming software.

The number of credits assigned to this module is our assessment of the learner effort required. It is our view that 10 ECTS of learner effort is required by learners coming new to the material to achieve the learning outcomes required.

6.10.8 Work-Based Learning and Practice Placement.

There is no work based learning or practical placement in the module.

6.10.9 E-Learning

The College VLE is used to disseminate notes, advice and online resources to support the learners. The learners are also given access to Lynda.com as a resource for reference.

6.10.10   Module Physical Resource Requirements

Requirements are for a fully equipped lecture hall and access for learners to a computer workstation with Music tech software. Access to hardware such as MIDI keyboards is also required.

6.10.11   Reading Lists and Other Learning Materials

Recommended Reading
Russ, M. (2009) *Sound synthesis and sampling.* Oxford: Focal Press.
Manning, P. (2013) *Electronic and Computer Music* Oxford: University Press.
Nothydurfter, C. (2015) *#HitIt: The Ultimate Guide to Programming Drums* CreateSpace Independent Publishing Platform

Secondary Reading
Collins, N. (2009) *Handmade electronic music: the art of hardware hacking.* New York: Routledge.
Emmerson, S. (2007) *Living electronic music.* Aldershot; Burlington: Ashgate.
Hewitt, M. (2009) *Composition for computer musicians,* Boston: Course Technology.
Holmes, T., (2015) *Electronic and experimental music: technology, music, and culture.* New York: Routledge.
Hosken, D. (2014) *An introduction to music technology.* New York: Routledge.
Moorefield, V. (2010) *The producer as composer: shaping the sounds of popular music.* Cambridge Mass.: MIT Press.
Puckette, M. (2007) *The theory and technique of electronic music.* Hackensack N.J.: World Scientific Publishing Co.
Rhind-Tutt, M. (2009) *Music technology from scratch.* London: Rhinegold Education.
Margulies, J. (2013) *Ableton Live 9 Power.* Boston; Delmar Cengage Learning.
Rumsey, F., (2004) *Desktop audio technology: digital audio and MIDI principles.* Oxford: Focal.
Rumsey, F. (1994) *MIDI systems and control.* Oxford: Focal Press.
White, P. (2002) *Recording and production techniques,* London: SMT.

Learners will be directed to appropriate journal literature and online material such as:
Computer Music Journal; Electronic Musician; Future Music; Sound on Sound; The Mix; The Wire; Create Digital Music; emusician.

6.10.12   Specifications of Module Staffing Requirements

For each instance of the module, there will be one lecturer qualified to at least Bachelor of Arts (Honours) level in Music Technology or equivalent and with a relevant third level teaching qualification (e.g. Certificate in Training and Education). Depending on numbers a lab assistant may be required. Where this is the case the Assistant will be required to have a sound understanding of music technology and computer based workstations, either through industry experience or academic qualification. For example, a final year Bachelor of Music Production (Honours) learner may be suitable to assist the lecturer in lab sessions. Any lab assistant will work under the supervision of the lecturer.

6.10.13   Module Summative Assessment Strategy

The assessment is based on a combination of project work and in-class presentation of research.

Assessment Element	Percentage Weighting	Description	Module Outcomes
Assignment	30%	Creation of a multi-articulation Sampler Patch using key switching and neighbour borrowing. Learners are required to create a digital sample patch (library) of any instrument, by recording (sampling) induvial notes/pitches of an instrument and creating a patch that can be used in any software sampler.	9.2
Assignment	40%	MIDI Composition using advanced MIDI editing and effects, synthesizers and Sampler patches. Learners will be required to compose a piece between 3-4 minutes in duration. The piece must contain elements of both synthesized sound and triggering of sampler patches. Recorded audio may also be used.	9.1 – 9.4
Presentation	30%	20 – 30-minute Group Presentation on a Virtual Instrument. Learners will be required to give a presentation, in class, on any virtual instrument they have researched. While this is a group presentation, individuals will present on separate elements of the instrument.	9.5

6.10.14   Sample Assessment Materials

Assessment 1:   Create a Sampler Patch.
Each participant will be required to choose an instrument and create a virtual sampler patch of this instrument. To achieve this each will be required to record individual keys from the synth and store each one as a note/pitch in digital audio format. Each pitch will require a minimum of three velocities (low, medium, hard) to convey volume. Particular attention should be paid to file organization and labelling from the very beginning of the process.
Participants will be required to record an appropriate amount of notes and utilise pitch processing techniques to produce un-sampled notes.
Once completed, participants will submit a sampler patch to be loaded into Apple Logic's ESX24 sampler, and a folder containing all raw samples, correctly labelled.

Assessment 2:   MIDI Song Programming

For this project, participants are required to create a piece of music from programmed virtual instruments. (roughly 3-4 minutes in duration).
Each piece will contain programmed rhythmic elements (e.g. drums, percussion, bass.) and programmed melodic elements (keys, guitars, strings).
Each piece should fit a desired genre (pop, RnB, E.D.M) chosen by the participant. Attention should also be paid to musical development throughout the piece.
Participants will also be allowed to add non-MIDI material, e.g. Vocals to the piece.
A stereo WAV file of the piece will be submitted along with the project file of the D.A.W. used by the participant. The final Wav file should be well mixed with respect to balance and tone.