

6.1 Module 1: Music Technology 1

Module Title	Music Technology 1
Module NFQ Level (only if an NFQ level can be demonstrated)	6
Module number/Reference	BAAMT101
Parent Programme	BA (Hons) in Audio and Music Technology
Stage of Parent Programme	1
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	None
Co-requisite module titles	None
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, a 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 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							50%	50%		100%

6.1.1 Module Aims and Objectives

The module sets out to enable learners to set up the hardware and software of a music production suite to record, edit and mix. It provides a foundation in audio and music technology. It also provides the requisite understanding of MIDI to facilitate a live performance.

6.1.2 Minimum Intended Module Learning Outcomes

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

- MLO 1.1 Describe the role, function and interconnections of the hardware and software components within a computer music production suite.
- MLO 1.2 Apply the functionalities of MIDI - i.e. channel voice and controller messages.
- MLO 1.3 Record, edit and mix music and sound using a digital audio workstation.
- MLO 1.4 Create a composition comprised of midi sequenced synthesised and sampled material as well as live recorded sounds (audio / instruments).
- MLO 1.5 Use music technology creatively to present a live midi performance.

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

Music Technology is a fundamental aspect of the audio industry. No matter what area of audio or music a practitioner works in, an understanding of music technology concepts and implementation issues are essential. The learning outcomes of this module relate and contribute particularly to the learner's attainment of Programme Learning Outcomes 3, 5 and 8.

6.1.4 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.

6.1.5 Module Content, Organisation and Structure

The module is organised to deliver theory through lectures (2 hours) and supervised tutorials (1 hour). During tutorials, each learner will have a workstation allowing the lecturer to work individually with learners to demonstrate and explain the material.

The 2-hour lectures each week will combine lecture delivery and discussion of 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

The computer as a music production platform

- Hardware and software requirements for professional recording platforms
- Correct setup procedures and an understanding of the basic components in a typical workstation
- Hardware connections, USB, fire-wire, audio and MIDI interfaces
- Installing applications and drivers
- Native vs. TDM processing
- Hardware buffer settings
- AMS, MMS

Introduction to the DAW

- Exploring the interface
- Creating tracks, types of tracks (MIDI, Instrument, Audio, Aux)
- Types of editors, absolute vs. relative
- Time-bases
- Edit and mixer windows

Recording on a DAW

- Audio and MIDI recording
- Latency, monitoring
- Metronome
- File hierarchy
- Loop recording
- Using playlists
- Introduction to virtual instruments
- Synthesizers, drum machines and samplers

MIDI Messages

- Control Voltage
- The MIDI Standard
- Channels, channel voice messages
- Continuous controller messages
- System messages, MTC
- The application of MIDI in live performance
- Real – time control of instruments
- Lighting and effects
- Rewire applications
- Planning and building MIDI mixers
- MIDI control of video
- Dedicated applications for live performance (Ableton, Mainstage)

Sampling

- Recording and importing samples
- Editing samples
- Key groups, velocity zones
- Crossfading, original pitch
- Key follow
- Methods of triggering playback
- Modulation matrix
- Assigning multiple outputs

Digital Audio

- A/D, D/A conversion
- Sampling frequency
- Bit depth and dynamic range
- Sample rate conversion, dither

Synthesis

- VCO, VCA, VCF,
- Low frequency oscillators
- Low pass, band pass and high pass filters
- Resonance
- Types of synthesis

The DAW in a professional Studio

- Cross-platform compatibility
- Technical planning and considerations of the modern-day project
- Strategies to ensure optimum audio quality and consistency when using more than one platform

The Virtual Patch-bay

- I/O setups for professional systems
- Multichannel configurations
- Customizing digital and analogue I/O

6.1.6 Module Teaching and Learning Strategy

This module is delivered using a combination of lectures and tutorials. An important part of music technology is understanding the parameters and controls within software and how to manipulate these within editors. These tutorials will focus on the connectivity between hardware and software and allow time for development of techniques.

Activity	Teaching / Learning Strategy	Learning Environment
Lectures (48 hours)	Lectures / participative discussions / problem solving exercises / practical demonstrations to link theory and practice / flipped classroom discussion and engagement	College
Tutorial (24 hours)	Learning / practical demonstration of music technology hardware and software connections / music technology techniques and recording software training	College / Mac labs
Assignment (96 hours)	Practice learning and perfecting music technology skills	College
Independent Work (82 hours)	Directed and self-directed learning / home study / practice use of DAW skills	College / Home

6.1.7 Timetabling, Learner Effort and Credit

The module is timetabled using one 3-hour session per week 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 hardware and software used within Music Technology.

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.

6.1.8 Work-Based Learning and Practice Placement.

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

6.1.9 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.

6.1.10 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.

6.1.11 Reading Lists and other information resources.

Recommended Reading

- Hosken, D. (2014) *An introduction to music technology*. New York: Routledge.
Rumsey, F. (2004) *Desktop audio technology: digital audio and MIDI principles*. Oxford: Focal.
Russ, M. (2009) *Sound synthesis and sampling*. Oxford: Focal Press.
White, P. (2002) *Sound synthesis and sampling techniques*, London: SMT.

Secondary Reading

Cole, B. (1996) *The composer's handbook*, London: Schott Educational.

Collins, N. (2009) *Handmade electronic music: the art of hardware hacking*. New York: Routledge.

Emmerson, S., (2007) *Living electronic music*. Aldershot; Burlington: Ashgate.

Holmes, T. (2015) *Electronic and experimental music: technology, music, and culture*. New York: Routledge.

Izhaki, R. (2011) *Mixing audio: concepts, practices and tools*. Oxford; Focal Press.

Rhind-Tutt, M. (2010) *Music technology from scratch*. London: Rhinegold Education.

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.

6.1.12 Specifications for 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.

6.1.13 Module Summative Assessment Strategy

Name	Description	Weighting	Learning Outcomes
Project 1 - Composition	3-4-minute composition utilising both audio and MIDI elements. Supporting documentation will be submitted detailing technical processes and critical reflection on working processes and an evaluation of the artefact.	50%	2, 3, 4
Project 2 (Practical) – Presentation and performance	Live MIDI performance and presentation on real-time hardware control of virtual instruments in a musical performance. Supporting documentation will be submitted detailing technical processes and critical reflection on working processes and an evaluation of the artefact.	50%	1, 2, 5

6.1.14 Sample Assessment Materials

Sample Assignment:

Composition on a Digital Audio Workstation

Using both MIDI and audio elements, you will compose and produce a 3 to 4-minute musical piece. You may use pre-recorded audio, but the production must include at least one track of original recorded audio. The MIDI elements must include at least two examples of the use of controller messages.

Your composition must involve the use of the following:

- Virtual synthesizer
- Software sampler
- Drum loops
- Drum machine

The final piece must be mastered to WAV format, 16-bit, 44.1 KHz.

All project files from the DAW must also be submitted.