



Higher Music Technology

Course code:	C851 76
Course assessment code:	X851 76
SCQF:	level 6 (24 SCQF credit points)
Valid from:	session 2023–24

This document provides detailed information about the course and course assessment to ensure consistent and transparent assessment year on year. It describes the structure of the course and the course assessment in terms of the skills, knowledge and understanding that are assessed.

This document is for teachers and lecturers and contains all the mandatory information you need to deliver the course.

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Course overview

The course consists of 24 SCQF credit points which includes time for preparation for course assessment. The notional length of time for candidates to complete the course is 160 hours.

The course assessment has two components.

Component	Marks	Scaled mark	Duration
Question paper	40	30	1 hour
Assignment	80	70	see 'Course assessment' section

Recommended entry	Progression
<p>Entry to this course is at the discretion of the centre.</p> <p>Candidates should have achieved the National 5 Music Technology course or equivalent qualifications and/or experience prior to starting this course.</p>	<ul style="list-style-type: none">◆ other qualifications in music technology, music or related areas◆ further study, employment and/or training

Conditions of award

The grade awarded is based on the total marks achieved across all course assessment components.

Course rationale

National Courses reflect Curriculum for Excellence values, purposes and principles. They offer flexibility, provide time for learning, focus on skills and applying learning, and provide scope for personalisation and choice.

Every course provides opportunities for candidates to develop breadth, challenge and application. The focus and balance of assessment is tailored to each subject area.

This course encourages candidates to become successful, independent and creative in their use of technologies and to continue to acquire and develop attributes and capabilities including creativity, flexibility and adaptability; enthusiasm and a willingness to learn; perseverance, independence and resilience; responsibility and reliability; and confidence and enterprise.

The course engages candidates through practical music-technology-based activities and tasks which are supported by knowledge and understanding of music technology and music concepts, form and structures.

The course enables candidates to develop and broaden their practical technical skills and creative use of music technology in challenging contexts. It includes opportunities for personalisation and choice in selecting varied contexts for learning.

Purpose and aims

Candidates develop and extend their knowledge and understanding of music technology and music concepts, particularly those relevant to 20th and 21st century music. They develop technical and creative skills through practical learning. The course provides opportunities for candidates to develop their interest in music technology and to develop skills and knowledge relevant to the needs of the creative industries.

The course aims to enable candidates to:

- ◆ develop skills in the analysis of music in the context of 20th and 21st century musical styles and genres
- ◆ develop a broad understanding of the music industry, including an awareness of the implications of intellectual property rights
- ◆ develop skills in the use of music technology hardware and software to capture and manipulate audio
- ◆ use music technology creatively in sound production in a range of contexts
- ◆ critically reflect on their own work and that of others

Who is this course for?

The course is suitable for candidates with a broad interest in music as well as those with a specific interest in music technology and 20th and 21st century music. It also provides a pathway for those who want to progress to higher levels of study.

The course is practical and experiential in nature and there is considerable scope for personalisation and choice through the contexts for learning. It can be contextualised to suit a diverse range of candidate needs, interests and aspirations.

Course content

The course consists of three areas of study:

Developing an understanding of 20th and 21st century music

Candidates develop knowledge and understanding of 20th and 21st century styles and genres of music, and an understanding of how music technology has influenced, and been influenced by, developments in 20th and 21st century music and by key innovators. They develop an understanding of aspects of the music industry, including an understanding of the implications of, and the need to protect, intellectual property rights. They also develop listening skills, enabling them to identify a wide range of genres and styles and their main attributes, and a wide range of relevant music concepts in the context of 20th and 21st century music.

Developing music technology skills

Throughout the course, candidates develop a range of skills and techniques relating to the creative use of music technology hardware and software to capture and manipulate audio. These skills include selecting and using appropriate audio input devices and sources; applying microphone placement techniques; designing and constructing the signal path for multiple inputs; setting input gain and monitoring levels; overdubbing and editing tracks; applying creative and corrective equalisation, dynamics processing, time domain and other effects; applying a range of mixing techniques; and editing multiple takes into a single take.

Music technology contexts

Candidates gain experience in using a wide range of music technology skills to capture and manipulate audio and sequenced data, and mix down to an audio master in an appropriate file format, in a range of contexts such as radio broadcast, composing and/or sound design for film, audiobooks and computer gaming.

Skills, knowledge and understanding

Skills, knowledge and understanding for the course

The following provides a broad overview of the subject skills, knowledge and understanding developed in the course:

- ◆ knowledge and understanding of 20th and 21st century musical styles and genres, and how they relate to the development of music technology
- ◆ knowledge of the features and functions of music technology hardware and software
- ◆ skills in using music technology hardware and software to capture and manipulate audio
- ◆ planning, implementation and evaluation of sound production
- ◆ application of music technology in creative ways
- ◆ awareness of a range of contexts in which music technology can be applied
- ◆ awareness of the implications of intellectual property rights in the context of music production
- ◆ the ability to critically reflect on own work

Skills, knowledge and understanding for the course assessment

The following provides details of skills, knowledge and understanding sampled in the course assessment.

Candidates are expected to have a secure understanding of the styles and genres, skills and concepts at National 3, National 4 and National 5 levels, in addition to knowledge and understanding of those specific to this course.

These styles and genres, skills and concepts are detailed in the tables below.

Styles and genres			
Higher	National 5	National 4	National 3
20th and 21st century classical music	rock 'n' roll	ragtime	jazz
electroacoustic	Scottish	swing	blues
indie	Celtic rock	skiffle	rock
jazz funk	60s pop	synth pop	disco
new wave	punk	electronica	
R 'n' B	country	dance music	
reggae	hip hop	rap	
soul	musical		
world music			

Technology skills

The technology skills listed below are those assessed in this course. Candidates may have developed the skills progressively from courses at National 3, 4 and 5.

Audio capture skills

- ◆ selecting and making appropriate use of at least two types of microphone and two polar patterns, with placement appropriate to the sound source, and using at least one stereo recording technique
- ◆ selecting and making appropriate use of at least one source which requires a direct line input
- ◆ selecting and using virtual and/or MIDI instruments to create electronic sound and/or music
- ◆ successfully designing and safely constructing the signal path for multiple inputs
- ◆ setting appropriate input gain and monitoring levels, with no distortion
- ◆ overdubbing at least one track

Processing skills

- ◆ editing tracks, including editing a minimum of three takes into a single take
- ◆ applying creative and/or corrective equalisation
- ◆ applying dynamics processing, including the use of compression and/or limiting, and noise gate

Applying effects

- ◆ applying time domain and other effects, including at least two from: delay, echo, reverb, chorus, phase, flange
- ◆ manipulating the controls of virtual and/or MIDI instruments (for example ADSR envelope, LFO, filter)

Mixing and sequencing skills

- ◆ applying a range of mixing techniques including using volume, panning, automation, send and insert effects and grouping/bussing to achieve a balanced and creative mix
- ◆ accurate synchronisation and/or sequencing in complex scenarios involving multiple takes and/or simultaneous events

Intellectual property (IP)

Candidates demonstrate understanding of the need to protect intellectual property (IP) rights, including:

- ◆ identifying ways in which IP may be infringed
- ◆ describing the effect of this on IP owners
- ◆ describing the effect of IP infringements on the music industry in general
- ◆ the role of PPL PRS Ltd and the Mechanical-Copyright Protection Society (MCPS) in administering IP issues

Technology concepts

	Technological terms	Processes	Controls and effects
Higher	ambience clipping file compression impedance parameters patch track object velocity	ADSR (attack decay sustain release) envelope autotune crossfade de-esser filter insert point plug-ins sample editor sample frequency submix threshold vocoder	cut-off frequency flanger graphical EQ harmoniser low-pass and high-pass filters modulation controller parametric EQ phase/phaser pitch shift portamento pre-fade and post-fade shelving EQ time compression and time expansion Q (bandwidth) tremolo triggering vibrato
National 5	glitch hum cyclical/loop playlist polar patterns (figure of eight, hypercardioid) sampler signal-to-noise ratio sound card spillage/leakage toolbox transpose	beat-matching digital processor drop in/out fade in/out import/export latency locators markers multi-effects processor quantisation vocal enhancer	auxiliary in(put)/out(put) (Aux) auxiliary send/return boost EQ/cut EQ chorus effect and depth close mic'd dB (decibels) gated reverberation (reverb) LFO limiter noise gate pitch bend punch in/out wah-wah/envelope filter

	Technological terms	Processes	Controls and effects
National 4	apps arrange window arrangement clipping feedback file management frequency response intro/outro lead vocal polar patterns (cardioid and omnidirectional) popping and blasting proximity effect sibilance take tempo	click track copy, cut and paste dry mix/wet mix effects pedals final mix general MIDI (GM) guide vocal input/output mute overdub peak sequencer signal path synchronisation (sync) WAV/AIFF file	compression/expansion effects (FX) fader line level microphone level tone control transport bar/controls
National 3	beat capture channel distortion/overload dry/wet frequency (hertz, kHz) microphone MIDI sequenced data session log track (names/list) virtual instrument tracks volume	backup copy format mix/mixing/balance normalising sampled save audio/stereo master USB (port)	delay EQ (equalisation) gain/trim mono(phonic) panning playback record reverb(eration) stereo(phonic) time domain

Technological developments

The technological developments listed below are those assessed in this course. Concepts which are listed in earlier tables, and are also considered to be technological developments, are included here (in bold text).

acoustic horn or cylinder

bass guitar

cassette recorder, player, tape

CD players

delay

DJ decks

DJ mixer

electric guitar (solid body)

electronic drum kit

electronic organ

gramophone records

guitar pick-up

juke box

microphone

MIDI

minidisc

MP3 players

multi-track recording (analogue and digital)

performance software

player pianos

radio

reel-to-reel magnetic tape

reverb

sampler

sequencer

stereo LPs

streaming audio

synthesiser

vinyl LPs and 45 rpm records

virtual instruments

wax cylinder

Music concepts

	Melody/harmony	Rhythm/tempo	Texture/structure/form	Timbre/dynamics
Higher	interval inversion relative major relative minor	irregular time signatures time changes	through-composed	accents harmonics phrase marks staccato marks
National 5	atonal cluster inverted pedal chromatic whole tone scale glissando modulation countermelody pitch bend tone/semitone	ritardando (rit) cross rhythms	strophic walking bass homophonic polyphonic coda bridge/link passage instrumental break	arco pizzicato rolls voices: mezzo-soprano, baritone
National 4	major/minor (tonality) broken chord or arpeggio change of key pedal scale octave vamp scat singing	syncopation 2 3 4 6 4 4 4 8 anacrusis accel(erando) rall(entando) a tempo	binary — AB ternary — ABA verse and chorus (song structure) middle 8 imitation	woodwind instruments, string instruments, brass instruments, percussion instruments, bass guitar, distortion, muted, backing vocals, voices: S A T B
National 3	ascending descending step (stepwise) leap (leaping) repetition sequence improvisation chord chord change	accent/accented beat/pulse BPM (beats per minute) 2, 3 or 4 beats in the bar on the beat/off the beat repetition slower/faster pause drum fill	unison/octave harmony/chord solo accompanied/unaccompanied repetition riff ostinato	acoustic/electronic striking (hitting), blowing, bowing, strumming, plucking acoustic guitar, electric guitar piano, organ, synthesiser drum kit voice/vocals crescendo (cres) diminuendo (dim)

Skills, knowledge and understanding included in the course are appropriate to the SCQF level of the course. The SCQF level descriptors give further information on characteristics and expected performance at each SCQF level, and can be found on the SCQF website.

Skills for learning, skills for life and skills for work

This course helps candidates to develop broad, generic skills. These skills are based on [SQA's Skills Framework: Skills for Learning, Skills for Life and Skills for Work](#) and draw from the following main skills areas:

3 Health and wellbeing

3.1 Personal learning

4 Employability, enterprise and citizenship

4.2 Information and communication technology (ICT)

5 Thinking skills

5.2 Understanding

5.3 Applying

5.4 Analysing and evaluating

5.5 Creating

Teachers or lecturers must build these skills into the course at an appropriate level, where there are suitable opportunities.

Course assessment

Course assessment is based on the information provided in this document.

The course assessment meets the key purposes and aims of the course by addressing:

- ◆ breadth — drawing on knowledge and skills from across the course
- ◆ challenge — requiring greater depth or extension of knowledge and/or skills
- ◆ application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This enables candidates to:

- ◆ apply knowledge from across the course, depth of understanding and listening skills to answer appropriately challenging questions about music and music technology concepts
- ◆ demonstrate aspects of challenge and application in practical contexts by planning, implementing and evaluating a creative production using music technology

Course assessment structure: question paper

Question paper

40 marks

The question paper allows candidates to use listening skills and draw on and apply knowledge and understanding of technological terms, technological developments, styles and genres, and music concepts, sampled from those listed in the 'Skills, knowledge and understanding for the course assessment' section of this document.

The question paper has 40 marks out of a total of 120 marks. This is scaled by SQA to represent 30% of the overall marks for the course assessment.

Candidates answer nine questions relating to music excerpts in a range of 20th and 21st century styles and genres. A range of question types are used, assessing understanding of relevant music and technological concepts, technological developments and IP issues:

- ◆ multiple-choice questions, allocated between 1 and 5 marks
- ◆ short-answer questions, allocated between 1 and 3 marks
- ◆ a restricted-response question on mic'ing, allocated 3 marks
- ◆ a restricted-response question assessing understanding of IP issues, allocated 3 or 4 marks
- ◆ an extended-response question assessing knowledge of technological developments or key innovators, allocated 4 or 5 marks
- ◆ a sequential listening question, allocated 7 marks

Candidates must answer all questions.

Setting, conducting and marking the question paper

The question paper is set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA.

Candidates have 1 hour to complete the question paper.

Specimen question papers for Higher courses are published on SQA's website. These illustrate the standard, structure and requirements of the question papers candidates sit. The specimen papers also include marking instructions.

Course assessment structure: assignment

Assignment

80 marks

The assignment allows candidates to demonstrate practical application of knowledge and skills from the course to plan, implement and evaluate a creative production using music technology.

Candidates produce the audio for a film soundtrack, audiobook, radio broadcast, computer game or other similar context.

The assignment has 80 marks out of a total of 120 marks. This is scaled by SQA to represent 70% of the overall marks for the course assessment.

Marks are awarded for:

- ◆ planning the production 20 marks
- ◆ implementing the production 50 marks
- ◆ evaluating the production 10 marks

Setting, conducting and marking the assignment

The creative production may be in any appropriate context such as (but not limited to) radio broadcast; composing and sound design for film; audiobooks; and computer gaming.

Candidates must combine multi-tracked recording(s) of sound and/or music and multi-tracked, electronically produced sound and/or music into a complete production appropriate to the chosen context.

The production must involve a minimum of 10 parts and be between 4 and 7 minutes in length.

Teachers or lecturers must agree on the context and production for candidates' assignments, to ensure they meet all of the requirements of the assessment task. The context and production must allow candidates to demonstrate all of the required technology skills listed in the 'Skills, knowledge and understanding for the course assessment' section above.

The assignment task is set by SQA and conducted under some supervision and control.

Evidence is submitted to SQA for external marking. All marking is quality assured by SQA.

Assessment conditions

Time

The assignment is carried out over an extended period of time in open-book conditions, allowing candidates to develop and refine their work before it is presented for assessment. Candidates should start their assignment at an appropriate point in the course when they have developed the necessary skills, knowledge and understanding.

Teachers and lecturers should consider the best time for candidates to start the assignment, taking account of time needed to:

- ◆ prepare for the assignment, which could include considering exemplars and developing and practising required skills
- ◆ carry out the stages of the task
- ◆ evaluate the process and completed production

Supervision, control and authentication

The assignment is conducted under some supervision and control. This means that although candidates may complete part of the work outwith the learning and teaching setting, teachers and lecturers must put in place processes to monitor progress and ensure that the work is the candidate's own, and that plagiarism has not taken place. For example:

- ◆ interim progress meetings with candidates
- ◆ questioning
- ◆ candidate's record of activity/progress
- ◆ teacher or lecturer observation

Resources

There are no restrictions on the resources to which candidates may have access while producing their assignment.

Reasonable assistance

Candidates must undertake the assessment independently. However, reasonable assistance may be provided prior to the formal assessment process taking place. The term 'reasonable assistance' is used to try to balance the need for support with the need to avoid giving too much assistance. If any candidates require more than what is thought to be 'reasonable assistance', they may not be ready for assessment or it may be that they have been entered for the wrong level of qualification.

Reasonable assistance may be given on a generic basis to a class or group of candidates, for example, advice on how to develop a project plan. It may also be given to candidates on an individual basis. When reasonable assistance is given on a one-to-one basis in the context of something the candidate has already produced or demonstrated, it could be that it becomes support for assessment and centres need to be aware that this may be going beyond reasonable assistance.

Candidates can seek clarification regarding the wording of the instructions for the assessment if they find them unclear. In this case, the clarification should normally be given to the whole class.

As this assignment is a summative assessment, support and guidance during planning, implementation and evaluation stages should be limited to minimal prompts and questioning, referring the candidate to the instructions provided in the assessment task.

Evidence to be gathered

The following candidate evidence is required for this assessment:

- ◆ formal plans for the production, which include explanations and justifications for all decisions relating to technological and musical aspects of the production (in written, electronic and/or oral form)
- ◆ the completed audio master (and, for Foley or computer game productions, the relevant video or game sequence)
- ◆ a detailed record of progress produced during the task (such as an electronic log or diary maintained by the candidate)
- ◆ a report which is clear, detailed and relevant, evaluating the planning, the development process and the final mix, against clearly stated criteria (in written, electronic and/or oral form)

The record of progress may be handwritten, or kept in electronic form (word-processed document or blog entry), or spoken and recorded, or in any other appropriate format.

Volume

There is no word count.

Grading

Candidates' overall grades are determined by their performance across the course assessment. The course assessment is graded A–D on the basis of the total mark for all course assessment components.

Grade description for C

For the award of grade C, candidates will typically have demonstrated successful performance in relation to the skills, knowledge and understanding for the course.

Grade description for A

For the award of grade A, candidates will typically have demonstrated a consistently high level of performance in relation to the skills, knowledge and understanding for the course.

Equality and inclusion

This course is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

For guidance on assessment arrangements for disabled candidates and/or those with additional support needs, please follow the link to the assessment arrangements web page: www.sqa.org.uk/assessmentarrangements.

Further information

The following reference documents provide useful information and background.

- ◆ [Higher Music Technology subject page](#)
- ◆ [Assessment arrangements web page](#)
- ◆ [Building the Curriculum 3–5](#)
- ◆ [Guide to Assessment](#)
- ◆ [Guidance on conditions of assessment for coursework](#)
- ◆ [SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work](#)
- ◆ [Coursework Authenticity: A Guide for Teachers and Lecturers](#)
- ◆ [Educational Research Reports](#)
- ◆ [SQA Guidelines on e-assessment for Schools](#)
- ◆ [SQA e-assessment web page](#)

The SCQF framework, level descriptors and handbook are available on the SCQF website.

Appendix 1: course support notes

Introduction

These support notes are not mandatory. They provide advice and guidance to teachers and lecturers on approaches to delivering the course. You should read these in conjunction with this course specification and the specimen question paper and coursework.

Developing skills, knowledge and understanding

This section provides further advice and guidance about skills, knowledge and understanding that you could include in the course. You have considerable flexibility to select contexts that will stimulate and challenge candidates, offering both breadth and depth.

The Higher Music Technology course engages candidates through practical music and sound-production activities. Candidates develop their ability to express themselves through music and sound. This encourages their creativity and autonomy. The course also enables candidates to gain knowledge and understanding of music and technological concepts. Across the course, skills and experiences which complement each other are developed.

You should ensure that candidates are fully aware of the range of skills, knowledge and understanding that they are developing in the course. These are laid out in full in tables in this course specification. You should also highlight any transferable learning that supports the development of skills for learning, skills for life and skills for work to candidates.

Approaches to learning and teaching

The Higher Music Technology course is particularly suited to a number of teaching methodologies. You should use an appropriate balance of these to deliver the course. You should balance whole-class, direct teaching opportunities with activity-based learning on practical tasks. You can actively involve candidates in developing their skills, knowledge and understanding by using approaches such as peer teaching, individual and group presentations and investigative tasks.

Learning should be planned so that skills, knowledge and understanding are developed together. You should plan learning and teaching experiences carefully to take account of candidates' previous skills.

Formative assessment activities, used to support learning, can be blended with learning activities throughout the course. For example:

- ◆ using assessment information to set learning targets and next steps
- ◆ adapting learning and teaching activities based on assessment information
- ◆ boosting candidates' confidence by providing supportive feedback
- ◆ using self- and peer-assessment activities wherever appropriate

Developing music technology skills topic

The focus of this topic is developing candidates' skills in:

- ◆ capturing audio from a range of sources
- ◆ using hardware and software to manipulate audio

Developing audio capture skills

Candidates are expected to develop the ability to use hardware and software to capture audio from a range of sound sources by:

- ◆ selecting and making appropriate use of at least two types of microphone and two polar patterns, with placement appropriate to the sound source, and using at least one stereo recording technique
- ◆ selecting and making appropriate use of at least one source which requires a direct line input
- ◆ selecting and using virtual and/or MIDI instruments to create electronic sounds and/or music
- ◆ successfully designing and safely constructing the signal path for multiple inputs
- ◆ setting appropriate input gain and monitoring levels, with no distortion
- ◆ overdubbing at least one track

During the early stages of delivering this topic, you could introduce candidates to underpinning knowledge, such as the basic components of a sound wave, including amplitude and frequency. Candidates should learn the basics of how a microphone converts a sound wave into a suitable signal for capture and storage on different mediums, for instance on digital hard drive or to analogue tape. If you have access to a digital audio workstation (DAW), you could show candidates examples of different recorded sound waves as a visual aid to understanding differences in levels and frequencies.

Candidates should learn the differences between dynamic and condenser microphones, and suitable uses for each. They should also learn about microphone polar patterns and suitable uses for different types. As a minimum this should include cardioid, omnidirectional and figure of eight. Where resources allow, candidates should experiment with different polar patterns to capture audio and compare results. Relatively inexpensive multi-pattern microphones are available that can switch between polar patterns. These can replace several different mics.

You should direct learning and teaching towards the equipment you have available and focus on the function and features of each part of the recording, mixing and editing system. If your centre has more than one type of recording set-up, you should encourage candidates to investigate functions and features of each.

Teaching approaches should be varied and could include a mix of demonstration, teacher explanation, practical activities, group work and individual experimentation. You should encourage candidates to experiment with several different types of music and instrumentation when applying microphone techniques and to experiment with audio capture of other sound sources, for example birdsong, classroom noise or nearby traffic. When

recording music ensembles, you should encourage candidates to play instruments for each other and help each other with set-ups, including microphone placement. Candidates should investigate different microphone placement techniques for different audio sources and should discuss the resulting recordings with their peers.

Candidates could be given the option to combine audio from sources not necessarily captured by microphone. Other sources could include direct injection of input from guitar and keyboards, virtual instrument plugins, or pre-recorded samples sourced from elsewhere. These should all be monitored at a suitable level and input gain should be set appropriately to achieve a good signal-to-noise ratio. Candidates should consider spillage when recording with microphones and they should use headphones for monitoring. They should also use punch-in and punch-out on tracks to correct any errors in performance or recording and overdub tracks in multi-tracked recordings.

Candidates could benefit from working in groups, where each member is allocated different responsibilities. One group member could be responsible for interconnecting recording equipment; another could deal with microphone placement; another could be responsible for setting recording levels; and others may decide on the audio to be recorded, for example a rock band or brass quintet. Roles and responsibilities could be rotated as each new recording is made. Candidates with prior knowledge and experience of recording equipment, both hardware and/or software, should be encouraged to assist the less experienced within their group with recording and mixing techniques. When embarking on the assignment, you should make candidates aware that they are responsible for all decisions, set-ups and recordings for their own projects.

Candidates should focus on developing a good range of essential skills, so recordings need not necessarily be completed works; short examples to demonstrate understanding and competence of the task are more appropriate.

You should emphasise the importance of health and safety and good practice when working with electrical and other equipment. Candidates should be taught how to set up equipment, like cables and microphone stands, correctly so that it does not create hazards.

Using hardware and software to manipulate audio

Candidates are expected to develop the ability to use hardware and software to manipulate audio from a range of sound sources by:

Processing

- ◆ editing tracks, including editing a minimum of three takes into a single take
- ◆ applying creative and/or corrective equalisation
- ◆ applying dynamics processing, including the use of compression and/or limiting and noise gate

Applying effects

- ◆ applying time domain and other effects, including at least two from: delay, echo, reverb, chorus, phase, flange
- ◆ manipulating the controls of virtual and/or MIDI instruments (for example ADSR envelopes, LFO, filter)

Mixing and sequencing

- ◆ applying a range of mixing techniques, including using volume, panning, automation, send and insert effects, and grouping/bussing to achieve a balanced and creative mix
- ◆ accurate synchronisation and/or sequencing in complex scenarios involving multiple takes and/or simultaneous events

A combination of practical activities and teacher or lecturer demonstrations could help candidates to develop these skills. Listening to examples of professionally recorded tracks enhances candidates' understanding of the various concepts. You should encourage candidates to experiment with different effects and mixing techniques and to critique each other's mixes.

Where possible, you should make pre-recorded examples of varied audio recordings available for candidates to practise different mixing and manipulating techniques. This could allow for comparisons between professionally recorded material and the treatment by the candidate. You should demonstrate the function of the mixing set-up and how to apply equalisation both as a corrective tool and as a creative process. You should demonstrate how to use time domain effects to enhance the recording and explain stereo imaging and the use of pan controls.

You should also explain the roles of grouping/bussing and automation in achieving a balanced and creative mix. You could, for example, set up a drum kit buss in a multi-tracked drum kit recording and discuss the benefits of this mixing technique. Candidates should also have experience of setting up and using effects busses for, for example, time domain effects. They should understand the difference between an insert effect on a channel and a send effect and be aware of good practice when setting up plug-in chains.

Once candidates understand the theoretical applications of effects and processes and are familiar with how to operate available equipment, they may find it beneficial and interesting to work on material that they have recorded themselves or with peers. You should encourage them initially to mix the audio without altering tonal content or adding any effects. When they are happy with the balance of sounds, they should consider applying changes if necessary.

You should fully explain the function and purpose of EQ and encourage candidates not to overuse it. Corrective EQ is likely to be required where a combination of mic'ing techniques is being used, where prominent room resonances have been captured and/or other artefacts have been introduced such as excess noise or bass accentuation due to proximity effect. You could also lead a class discussion around the use of EQ and the emphasis of instruments and sounds in different genres of music. These discussions can centre on achieving a balanced and appropriate audio spectrum, depending on the genre.

You should encourage candidates to listen to commercial recordings from a range of genres and evaluate the main elements of the sound and how it is created. Examples could include modern country music, where the vocal is the predominant instrument; vocal treatment in rock music, where it tends to be at a lower level than guitars and drum kit; rock 'n' roll, where the emphasis is on guitars and keyboards; or reggae, with an emphasis on bass frequencies.

The subject of time domain effects and dynamics processing is vast and cannot be covered fully within the course. However, it is important that candidates have an understanding of the controls and parameters of compression, noise gates and reverberation. You should teach candidates how to use these processors through demonstration and experimentation. Listening to examples of effects will greatly enhance candidates' understanding. They could try to recreate effects within their own recordings, where possible. You should explain how inappropriate overuse of effects can negatively affect a final mix.

Candidates should combine both multi-tracked audio and multi-tracked virtual instrument and/or MIDI tracks in a recording in preparation for course assessment. Many editing techniques and functions are the same for both audio and MIDI in software-based DAWs, so using both together reinforces understanding of the editing software.

Once candidates have mastered the techniques and functions of the mixing and editing software, you should encourage them to work on mixes of their own recorded material. To enhance their understanding, candidates could attempt several contrasting treatments of the same recording and then evaluate each example.

As preparation for course assessment, candidates could keep session logs for each recording they complete, noting any changes made. This could include screenshots (which should be dated) to demonstrate progress within a recording or mix down. The log should reflect the session type, microphone placement and selection, track lists and timings.

Useful resources

Each centre will have different resources. Typical resources for this topic could include:

- ◆ dynamic and condenser microphones with stands
- ◆ appropriate cabling for microphones, other audio input or sound sources and monitors
- ◆ multi-track recording, editing and mixing equipment
- ◆ monitoring system
- ◆ outboard or built-in effects processors and EQ

There are many different recording systems available, some stand-alone and others computer-based. Currently, Pro Tools, Logic, Cubase, and REAPER are among the most popular software-based recording packages.

Candidates would benefit from access to a DAW based around a computer with appropriate software and hardware. A suitable system might include:

- ◆ a computer with at least 4GB of RAM
- ◆ a hardware audio interface with a minimum of four microphone inputs and line and instrument inputs
- ◆ appropriate cabling for microphones, other audio sources and monitors
- ◆ a MIDI keyboard and USB controller
- ◆ a monitoring system
- ◆ headphones
- ◆ recording and sequencing software with effects, dynamics and EQ plugins
- ◆ an external digital storage device

Developing understanding of 20th and 21st century music topic

The focus of this topic is developing candidates' ability to:

- ◆ explain the relationships between technological developments and 20th and 21st century music
- ◆ use listening skills in the context of 20th and 21st century music

Explaining how technological developments relate to 20th and 21st century music

Candidates are expected to develop the ability to explain the relationships between technological developments and 20th and 21st century music by:

- ◆ describing genres in terms of their key innovators, attributes and technologies used
- ◆ explaining how a technological development has influenced a number of genres
- ◆ explaining how a key innovator has influenced development in music technology

In the question paper, candidates are asked questions about genres, a technological development, and a key innovator of music technology. To prepare for this candidates could select a key technology from the list of technological developments below, explore an innovator of this technology, and look at how the innovator influenced its development.

Technological developments

acoustic horn or cylinder
bass guitar
cassette recorder, player, tape
CD players
delay
DJ decks
DJ mixer
electric guitar (solid body)
electronic drum kit
electronic organ
gramophone records
guitar pick-up
juke box
microphone
MIDI
minidisc
MP3 players
multi-track recording (analogue and digital)
performance software
player pianos
radio
reel-to-reel magnetic tape
reverb
sampler
sequencer
stereo LPs
streaming audio
synthesiser
vinyl LPs and 45 rpm records
virtual instruments
wax cylinder

Developing listening skills in the context of 20th and 21st century music

Candidates are expected to develop listening skills in the context of 20th and 21st century music to enable them to identify examples of a wide range of:

- ◆ genres and styles and their main attributes
- ◆ relevant music concepts
- ◆ relevant technology concepts

These listening skills are best developed in an integrated way.

Genres and styles

You should give candidates the opportunity to study a wide variety of music styles that have been used and become popular at different points in the 20th and 21st centuries. Appropriate genres for study at Higher include (but are not limited to) 20th and 21st century classical music, electroacoustic, indie, jazz funk, new wave, R 'n' B, reggae, soul, and world music. This study should incorporate the development of musical instruments and the methods used to record and distribute music over this period. In addition, genres and styles covered at National 3, National 4 and National 5 levels should be revised and consolidated. The full list of these is included earlier in this course specification.

Music concepts

Candidates should be able to describe and identify a range of music concepts, including those listed below.

Melody/harmony	Rhythm/tempo	Texture/structure/form	Timbre/dynamics
interval inversion relative major relative minor	irregular time signatures time changes	through-composed	accents harmonics phrase marks staccato marks

In addition, music concepts covered at National 3, National 4 and National 5 levels should be revised and consolidated. The full list of these is included earlier in this course specification.

Learning activities

Learning activities could include:

- ◆ giving candidates the opportunity to experience an appropriate range of music, relating the styles of music to social backgrounds of the time, the mechanical means by which new music could be heard by a wider audience and the impact the music had on listeners' lives — a particularly appropriate genre would be soul music
- ◆ candidates could develop their listening skills by using worksheets to describe their impressions of music they hear, their personal responses to music, the musical instruments and the geographic and cultural context of music — for example comments about indie music could include a typical band's instrumental line-up, the production of low-budget recordings and the use of effects in the mix
- ◆ studying specific elements of genres
- ◆ class discussions as a follow-on to a teacher- or lecturer-led analysis of a selected style, based on varied critical reaction to listening experiences within the class
- ◆ identifying technology as it is used in live productions, making reference to appropriate equipment such as microphones, effects, PA systems and mixing desks, using examples from popular works, possibly including school productions
- ◆ researching and discussing a key innovator of a particular genre, focusing on the technologies used, for example Herbie Hancock's use of synths and electric keyboard in the jazz-funk genre

- ◆ candidate review sessions where individuals or groups create questions for the rest of the class based on their choice of genre, for example the sound of new wave in the songs and instrumental line-up of Blondie
- ◆ a paired discussion based on a teacher- or lecturer-led lesson where the findings of the discussion can be shared with the rest of a class; this could be based on the development and use of a particular type of technology and which groups of musicians used it, for example reel-to-reel magnetic tape, or 8-track and multi-track recording equipment
- ◆ listening to a piece of music and identifying the technology used to create or recreate it, as the basis for a group or class discussion
- ◆ listening to film music to identify genres

Intellectual property

You should guide candidates to explore music copyright so that they can understand and then explain the need to protect intellectual property rights. In particular, candidates should be able to:

- ◆ identify ways in which IP may be infringed
- ◆ describe the effect of this on IP owners
- ◆ describe the effect of IP infringements on the music industry in general
- ◆ describe the role of the PPL PRS Ltd in administering IP issues

You could describe current copyright legislation and explain the process of obtaining copyright clearance.

You could also present relevant case studies of copyright infringement with examples of music to encourage class discussion. In small groups candidates could investigate high-profile cases, where the proper copyright clearance procedures were not followed, so that they can gain an understanding of the potential consequences of not obtaining the appropriate licence and clearances.

At all times, candidates must be aware of, and follow current legislation about creating, performing and using music, samples and other forms of intellectual property. Candidates should investigate and suggest possible ways to avoid infringing copyright.

Useful resources

Each centre will have different resources. Typical resources for the understanding 20th and 21st century music topic could include:

- ◆ good quality audio playback facilities with stereo speakers
- ◆ decent quality headphones for individual work
- ◆ computer systems with appropriate software for playing CDs, DVDs and audio files
- ◆ access to the internet for individual and group research — the Performing Arts Resource Guide in the Library of Congress (Washington DC), archival sound recordings in the British Library, mixing with BBC sound engineers and downloadable materials from popular sites are especially useful

- ◆ photographic evidence of recording and playback devices used during the period of study
- ◆ recordings of televised documentary programmes that deal with specific genres from the period of study
- ◆ interactive classroom boards for presentations to a group or class
- ◆ a range of CDs, DVDs and audio files that demonstrate the variety of music styles through the 20th and 21st centuries
- ◆ personal music players for playing back downloaded music
- ◆ where available, music scores of appropriate examples from different genres
- ◆ textbooks, CD and DVD cover notes, programme notes for reference and support purposes

Music technology contexts topic

The focus of this topic is developing candidates' ability to produce audio masters in different contexts. Candidates are expected to do this by:

- ◆ applying a wide range of skills in audio capture
- ◆ applying a wide range of skills to manipulate audio and sequenced data
- ◆ mixing down to an audio master in appropriate file format(s)

Candidates could produce several short pieces of work, in a range of contexts, to develop their ability to capture sound, manipulate it, and then mix it down to an audio master.

Suitable contexts could include:

- ◆ recording a live rock band, including overdubs
- ◆ multi-tracking a musical ensemble (for example a rock band or folk group)
- ◆ recording a choir or ensemble using appropriate stereo mic'ing techniques
- ◆ creating a short soundtrack for a film, including sound design and music
- ◆ producing a short radio broadcast involving music, speech, and other appropriate content
- ◆ arranging or composing using a MIDI program
- ◆ producing sound effects for a drama
- ◆ recording narration of a story or poem, and adding music and sound effects
- ◆ creating an advertising jingle
- ◆ making use of samples and loops for remixing
- ◆ creating an audiobook

Candidates will benefit from investigating a wide range of contexts.

Candidates may find it helpful to see realistic examples of acceptable and achievable creative projects. You could select and describe short sequences from some of the following media: film, television, radio, animation and computer games. You could also lead class or group discussions to analyse possible reasons for the choice of sounds and music, for example to set the mood, establish environment, support narrative, establish character, convey emotions, create and support transition.

Through discussion, you could involve the candidates in creating a sound-design map to clearly identify the sound and music placed in the sequence viewed. This could be in a linear depiction, timeline, or storyboard. This process would allow candidates to develop their understanding of how various sounds and music support the narrative or image. This can also provide an example framework for candidates to use in the planning stages of the assignment.

You could divide the class into small groups and give each group a short sequence from a film. Through collaboration, the groups could decide what form of sound-design map they will produce for this task, then present and discuss their findings. This task can prepare candidates to plan and execute a sound-design map for their individual creative production.

Candidates could analyse audio clips to explore production techniques used in 20th and 21st century music and incorporate these approaches into their projects. Candidates can explore genres of personal interest, but you should have some input at this level.

Candidates must ensure that all intellectual copyright for music produced and selected for their project has not been infringed.

Through well-chosen examples, you could demonstrate how to manipulate loops and samples. Building up beats, bass parts and programming filter sweeps, as well as other virtual instrument controllers, would provide candidates with new perspectives on sequencing within larger DAW software.

Candidates are expected to use skills developed throughout the course to set up and dismantle equipment, and to observe industry conventions and standards of health and safety at all times. For example, when using microphones, candidates should be aware that microphone polar patterns, techniques and placement are critical to the capture and recording quality and that the exact placement and application is dependent on factors such as acoustic environment, instrumentation and performer. At this level, candidates should begin to use polar pattern and/or positioning in an informed and creative manner, basing their decisions on industry standards and experimentation.

You can informally steer candidates towards good practice in using microphones, recording and mixing techniques through encouraging access to web-based resources, and developing links with other candidates through, for example, GLOW groups and blogs and by following up individual interests in the techniques used by notable practitioners.

The appropriate use of equalisation and panning, developed earlier in the course, should be applied in a variety of contexts. Candidates could be given an audio session and asked to set the EQ on each track; you would observe, giving support and guidance. Candidates could then bounce tracks to an audio master as preparation for course assessment.

Candidates should be taught how to use dynamics processors, such as compressors, limiters and noise gates through demonstrations that explain the purpose and application of the controls. Candidates can then apply compression, limiting and gating appropriately to tracks within their own audio sessions.

Candidates could listen to and analyse short clips from a variety of sources that exemplify typical and creative application of time domain and modulation effects. You could

supplement this by demonstrating different effects on selected tracks. Candidates could then apply an effect(s) to the tracks within their audio session and bounce down to an audio master.

Journal of progress and reflection

You should encourage candidates to maintain a journal. This could be in the form of a written journal, blog or diary. It should include:

- ◆ a timeline of progress through planning, creating and producing the end product
- ◆ reflections on their accomplishments

This journal is good preparation and practice for the assignment.

Sequencing and delivery

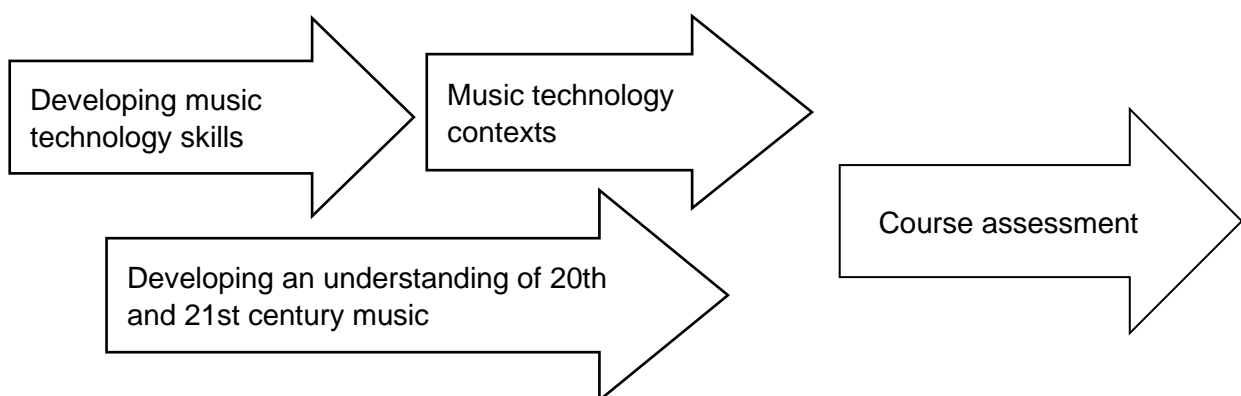
There are many different ways to deliver the Higher Music Technology course. The following information provides some advice on possible approaches.

Delivery approach 1: sequential delivery of the three main topics

The three main topics — developing an understanding of 20th and 21st century music, developing music technology skills, and music technology contexts — could be delivered independently and individually over the duration of the course. However, some integration and blending of topics would be appropriate.

Delivery approach 2a: concurrent delivery of main topics

This approach allows technology skills to be developed concurrently with the relevant music understanding, and is a straightforward way of building up skills and knowledge, culminating in the course assessment (assignment and question paper).



Developing music technology skills could be the starting point for the course. Through this topic, candidates develop the essential technological skills and knowledge for the course. Candidates are introduced to the relevant hardware and software required to capture audio. This could include using a microphone, inputting notes using a MIDI sequencing program, or recording an electric guitar directly into a computer. A wide range of skills are covered during these processes — for example selecting appropriate microphones and placements, setting

gain levels, ensuring instruments are tuned, inputting MIDI data. Once captured, candidates should manipulate and edit the sound(s) using appropriate processes and effects.

Learning could be based around short demonstrations, followed by hands-on candidate activities.

While developing basic skills through the developing musical technology skills topic, candidates can begin to develop their music knowledge and listening skills through another topic — developing an understanding of 20th and 21st century music.

In the developing an understanding of 20th and 21st century music topic, candidates study a range of styles and genres of music. Technology concepts are also explored and candidates begin to understand the influence of music technology on music and, conversely, how music has influenced music technology. Candidates could individually research key innovators who have led the way in these developments, and then present their findings to the class.

The music technology contexts topic builds on the practical skills and relevant concepts from the other two topics. Candidates bring these together to produce short pieces of work in a variety of contexts. Possible contexts include recording a rock band, recording a choir, creating a short soundtrack for a film, a short radio broadcast, arranging or composing using a sequencing program, producing sound effects for drama, combining narration of a story or poem with some music, creating an advertising jingle, and using samples and loops for remixing. This would be valuable preparation for the assignment.

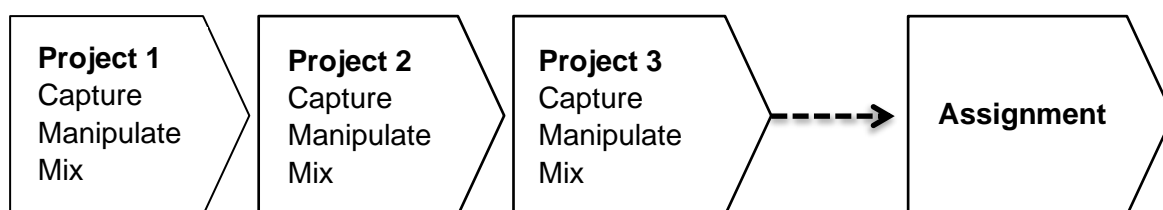
Delivery approach 2b: mix first, capture later

In delivery approach 2a, described above, candidates start by learning how to capture sounds, then how to manipulate them, and finally how to mix them to produce a finished product. An alternative, and equally valid, approach is to develop skills of manipulating and mixing first, using supplied audio files. The skills of capturing audio, involving choosing appropriate devices, microphone placement and designing signal paths would be developed later.

Where resources are limited, a combination of delivery approaches 2a and 2b may be necessary, with different groups carrying out practical activities in different sequences, to overcome limited access to computers or sound capture equipment.

Delivery approach 3: integrated approach using a series of mini-projects

An alternative method of delivery could involve a series (more than the three shown in the diagram below) of mini-projects, each building additional technical skills and knowledge.



Each project could include some new aspects of audio capture, audio manipulation and mixing, and be presented in a new context. Candidates could work in small groups on different projects at the same time. This approach would allow school events (like concerts or shows) to be incorporated naturally into the course delivery, with possible opportunities for inter-disciplinary working. Gradually, over the duration of the course, skills and understanding would be developed to the stage where candidates are ready to undertake the assignment.

Understanding of 20th and 21st century music could be developed as a separate but concurrent strand, or it might be possible to integrate some or all of the learning into carefully chosen projects.

Preparing for course assessment

Within the notional time for the course, time is required for:

- ◆ preparing for the assignment tasks
- ◆ carrying out the stages of the assignment tasks
- ◆ assessing the process and completed solution
- ◆ consolidating learning
- ◆ preparing for the question paper

The 'Approaches to learning and teaching' section contains detailed suggestions and strategies for preparing candidates for the assignment and question paper.

Developing skills for learning, skills for life and skills for work

You should identify opportunities throughout the course for candidates to develop skills for learning, skills for life and skills for work.

Candidates should be aware of the skills they are developing and you can provide advice on opportunities to practise and improve them.

SQA does not formally assess skills for learning, skills for life and skills for work.

There may also be opportunities to develop additional skills depending on approaches being used to deliver the course in each centre. This is for individual teachers and lecturers to manage.

Some examples of potential opportunities to practise or improve these skills are provided in the following table.

Skill	Opportunity to practise or improve skill
3 Health and wellbeing 3.1 Personal learning	<ul style="list-style-type: none"> ◆ researching information about microphone types ◆ exploring the effects of changing microphone placements ◆ researching information about selected genres, styles and key innovators ◆ considering the impact of intellectual property legislation on case studies and own practice ◆ researching information about a range of contexts where music technology may be used
4 Employability, enterprise and citizenship 4.2 Information and communication technology (ICT)	<ul style="list-style-type: none"> ◆ using hardware and software to capture and manipulate audio ◆ interfacing audio-capture equipment with computer systems ◆ using search engines to research technological developments, genres and styles ◆ producing text-based and audio-visual reports on research findings
5 Thinking skills 5.2 Understanding 5.3 Applying 5.4 Analysing and evaluating 5.5 Creating	<ul style="list-style-type: none"> ◆ explaining the purpose and effects of a range of ways of manipulating audio ◆ using knowledge of genres and styles to identify examples in music excerpts ◆ using knowledge of music concepts to identify examples in music excerpts ◆ making appropriate choices of input devices ◆ applying a range of audio manipulation techniques ◆ explaining the application of intellectual property legislation in the music industry ◆ applying skills and knowledge in new contexts ◆ reflecting on results of tasks, and making appropriate improvements ◆ producing an audio master

The course may also provide opportunities to develop or consolidate other skills for learning, skills for life, and skills for work, including:

- ◆ reading
- ◆ writing
- ◆ working with others
- ◆ enterprise
- ◆ citizenship

Appendix 2: online resources

Online resources (for example websites, microsites, wikis, newsfeeds, databases) can provide a valuable source of easily accessible and up-to-date information on a wide range of music technology hardware, software and topics. Some suggested online resources are listed below.

Websites	Resources
Intellectual property	
PPL PRS Ltd and the Mechanical-Copyright Protection Society (MCPS)	Information about licensing
Association of Independent Music	Wide range of advice and downloadable resources
British Academy of Songwriters, Composers and Authors (BASCA)	Downloadable paper on intellectual property in educational resources section
The British Recorded Music Industry (BPI)	Useful glossary of terms, and information on copyright, in visitors' area
Merlin Network (merlinnetwork.org)	Copyright protection agency for musicians
Musicians' Union (MU)	Wide range of advice for professional musicians
UK Music	Supporting the UK music industry
Ofcom	Information on broadcasting licences
Microphones and recording	
Shure www.shure.co.uk/discover/educational	A website with microphone technique tutorials
Shure blogs blog.shure.com/multi-pattern-microphones-what-where-and-how/	Information on microphones, polar patterns and other general advice
Planet of Tunes	General website with sections on sound theory, sound recording, MIDI sequencing and much more
Making your microphone placement work	Audio recording tutorials with useful hints and tips
Sound on Sound	Microphone and recording techniques and technical tutorials
General information	
SAE Institute	Follow link to reference library for a wide range of useful documents on audio technology
Renaissance Recording Studio, Nashville homepage	Sections on microphone technique, tracking tips and mixing tips
120 Years of Electronic Music: The history of electronic music from 1800 to 2015	Useful website for information about music technology developments
Royalty-free music and sound effects	
Stonewashed AudioMicro	Sources of royalty-free music and sound effects that can be used in tasks and projects

Administrative information

Published: May 2023 (version 3.0)

History of changes

Version	Description of change	Date
2.0	'Setting, conducting and marking the assignment' section clarified: 'Candidates must combine multi-tracked recording(s) of sound and/or music and multi-tracked, electronically produced sound and/or music into a complete production appropriate to the chosen context.' Course support notes and online resources added as appendices.	July 2018
3.0	Assignment marking instructions removed and will be published in the coursework assessment task document.	May 2023

Note: you are advised to check SQA's website to ensure you are using the most up-to-date version of this document.

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