

Unit	Topic	Lesson	Lesson Objectives
<b>Audio Engineering</b>			
<b>Course Overview</b>			
<b>Introduction</b>			
Define audio engineering			
Identify careers for audio engineers			
List tips for achieving academic success in the course			
<b>Start the Course</b>			
Identify computer requirements			
Learn how to navigate through the course			
Learn how to switch between windows			
<b>Set Up Your Computer</b>			
Find files and folders on a computer			
Set up a computer to show the List folder view and file name extensions			
Make a course folder			
<b>Set Up a Browser and Install 7-Zip</b>			
Set up a Web browser			
Download and install a zip utility			
Zip and unzip files and folders			
<b>Download and Install Resources</b>			
Get the course resources			
Install software			
Identify sources of trustworthy information			
<b>Understanding Sound</b>			
<b>Sound</b>			
Identify sound sources			
Identify the parts of a speaker			
Test speakers and/or headphones			
Identify the different parts of an audio waveform			
Identify the difference between volume and loudness			

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		<b>Make Waveforms</b>	<ul style="list-style-type: none"> <li>Measure amplitude</li> <li>Generate sine, square, and sawtooth wave tone waveforms</li> <li>Play back sound</li> <li>Zoom with the mouse and the keyboard</li> <li>Undo and redo commands</li> </ul>
		<b>Manipulate Waves</b>	<ul style="list-style-type: none"> <li>Define and identify phase</li> <li>Duplicate audio tracks</li> <li>Define and identify different phase angles</li> <li>Phase shift waves with the Time Shift Tool</li> <li>Save Audacity project files</li> </ul>
		<b>Frequency</b>	<ul style="list-style-type: none"> <li>Define frequency, pitch, and octaves</li> <li>Identify octave frequencies</li> <li>Generate tones at specific frequencies and octaves</li> <li>Loop, mute, and solo audio</li> <li>Identify the partial of a fundamental tone frequency</li> </ul>
		<b>Clean Up Audio</b>	<ul style="list-style-type: none"> <li>Define and identify noise and noise colors</li> <li>Generate noise</li> <li>Import an audio file</li> <li>Select audio with the Selection Tool</li> <li>Remove noise from an audio file</li> </ul>
		<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>Define health and safety for audio engineers</li> <li>Define and identify parts of the human ear</li> <li>Identify sound thresholds and types of hearing loss</li> <li>Identify steps for reducing damage to the ears</li> <li>Define ergonomics and repetitive strain injury</li> </ul>

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<b>Recording Audio</b>			
<b>Analog Recording Technology</b>			
Define analog recording technology			
Define mechanical audio devices			
Define wax cylinders, record, and magnetic tape, and how they work			
Define overdubbing and multitrack recording			
Identify the disadvantages of analog audio recording			
<b>Digital Recording Technology</b>			
Define digital recording technology			
Define digital audio, and identify different digital audio hardware			
Identify differences between analog and digital audio			
Identify the advantages of digital audio			
<b>Recording Studios</b>			
Define acoustics			
Define different types of recording studios			
Define different rooms and equipment in a recording studio			
Identify considerations when designing a studio			
<b>Echoes</b>			
Define acoustical problems			
Define echoes, and how to deal with them			
Generate silence			
Add an echo effect			
<b>Reverb</b>			
Define reverb, and how to deal with it			
Identify useful GVerb settings			
Add a reverb effect			
<b>More Acoustical Problems</b>			
Define leakage, and how to fix it			
Define standing waves, and how to fix them			
Define noise floor, and how to reduce it			
Define frequency balance, and how to fix it			

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			<b>Audio Software Tools</b>
			<b>DAW Software</b>
			Define and identify features of DAW software
			Identify computer requirements and recommended computer hardware
			Define DAW-specific hardware
			Identify Audacity's advantages and features
			Identify types of software licenses
			<b>Other Audio Tools</b>
			Define MIDI and its history
			Identify MIDI cables and jacks
			Define Channel Voice messages
			Define and identify looping software and when to use it
			Identify how to find audio loops to use
			<b>Multitrack Music Project</b>
			Define syncing and sync audio
			Define tempo
			Change the tempo of an audio file
			Change the pitch of an audio file
			Change the speed (tempo + pitch) of an audio file
			<b>Audio File Formats</b>
			Define audio file format and audio codec
			Identify uncompressed audio file formats
			Define audio file compression and audio data loss
			Define lossless and lossy audio compression
			Identify lossless and lossy audio formats
			<b>Encode Audio</b>
			Define encoding and constant and variable bit rates
			Define metadata
			Define and install LAME MP3 Encoder and FFmpeg Library
			Export audio in WAV, MP3, AAC, and FLAC formats
			Compare audio format file sizes

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<b>Mics and Mixing</b>			
<b>Microphone Hardware</b>			
Define microphone and transducer			
Identify different types of microphone transducers and the parts of a microphone			
Define connectors			
Define active and passive mics			
Define phantom power			
<b>Microphone Specifications</b>			
Define and identify microphone specifications			
Define frequency response			
Define proximity effect			
Define transient response			
Identify output characteristics			
<b>Microphone Placement</b>			
Define and identify microphone placement			
Define mono and stereo sound			
Identify techniques for mic'ing for stereo sound			
Identify techniques for placing mics for instruments			
Define preamp and direct input box			
<b>Using Other People's Music</b>			
Define intellectual property, copyright, digital rights management, and samples			
Define fair use and identify ways to use works fairly			
Define public domain			
Identify types of licenses and Creative Commons licenses			
Define giving credit			
<b>Mix Samples</b>			
Define mixing samples			
Identify and remove unwanted audio tracks			
Define repeating samples			
Define stereo and mono Audacity track types			
Add blank stereo and mono tracks and repeat samples of audio			

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		<b>Finish Mixing Samples</b>	<ul style="list-style-type: none"> <li>Define gain, and change the gain of an audio track</li> <li>Define pan, and pan an audio track</li> <li>Split a stereo track into two mono tracks</li> <li>Combine two mono tracks into a stereo track</li> <li>Define envelope and the Envelope Tool</li> <li>Use the Envelope Tool to modify an audio track's envelope</li> </ul>
	<b>Mastering Sound</b>		
		<b>Mastering and EQ</b>	<ul style="list-style-type: none"> <li>Define mastering and mastering goals</li> <li>Define audio signal processing</li> <li>Define equalization and identify its uses</li> <li>Define positive and negative decibels</li> <li>Identify ways to use the Equalization Tool and equalize audio with the Equalize Tool</li> </ul>
		<b>Continue Using EQ</b>	<ul style="list-style-type: none"> <li>Define the Draw Curves Mode</li> <li>Use the Draw Curves Mode and draw curves</li> <li>Identify and use EQ curve presets</li> <li>Make and save a curve preset</li> </ul>
		<b>Compress Audio</b>	<ul style="list-style-type: none"> <li>Define level meters</li> <li>Define and identify the parts of the Meter ToolBar</li> <li>Define dynamic range compression and identify the controls in the Dynamic Range Compressor</li> <li>Find the peaks in an audio track</li> <li>Compress audio</li> </ul>
		<b>Normalize and Fade</b>	<ul style="list-style-type: none"> <li>Define normalization</li> <li>Define Normalize Effect</li> <li>Normalize audio</li> <li>Define fading, fade in, fade out, and crossfading</li> <li>Fade and crossfade sound</li> <li>Define Silence Audio Command</li> <li>Silence audio</li> </ul>

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**Phaser and Wahwah Effects**

- Define phaser and Phaser Effect
- Add a Phaser Effect
- Define wahwah and Wahwah Effect
- Add wahwah to audio