Audio Engineering - Course Outline		Points Possible	Course Hours
Course Orientation and Course Overview			**7**
Lesson 1: Start the Course			
	Identify computer requirements.		
	Learn how to move through the course.		
	Switch between windows.		
Lesson 2: Set Up Your Computer			
	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.		
Lesson 3: Set Up a Browser and Install 7-Zip			
	Set up a Web browser.		
	Download and install a zip utility.		
	Zip and unzip files and folders.		
Lesson 4: Find and Complete Coursework			
	Get the course resources.		
	Install software.		
	Learn about finding, completing, and turning in assignments.		
Section 1: Understanding Sound			**15**
Lesson 1: Sound			
	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.		
Lesson 2: Make Waveforms			
	Measure amplitude.		
	Generate sine, square, and sawtooth wave tone waveforms.		
	Play back sound.		
	Zoom with the mouse and the keyboard.		
	Undo and redo commands.		
Lesson 3: Manipulate Waves			
	Define and identify phase.		
	Duplicate audio tracks.		
	Define and identify different phase angles.		
	Phase shift waves with the Time Shift Tool.		
	Save Audacity project files.		
Lesson 4: Frequency			
	Define frequency, pitch, and octaves.		
	Identify octave frequencies.		
	Generate tones at specific frequencies and octaves.		
	Loop audio.		
	Mute and solo audio.		
	Define simple and complex waveforms.		
	Define harmonics, fundamental tones, and partials.		
	Identify the partial of a fundamental tone frequency.		
Lesson 5: Clean Up Audio			
	Define and identify noise and noise colors.		
	Generate noise.		
	Import an audio file.		
	Select audio with the Selection Tool.		
	Remove noise from an audio file.		

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Lesson 6: Health and Safety			
	Define health and safety for audio engineers.		
	Define and identify parts of the human ear.		
	Identify sound thresholds.		
	Identify types of hearing loss.		
	Identify hearing protective gear.		
	Identify steps for reducing damage to the ears.		
	Define ergonomics and repetitive strain injury.		
	Identify methods for improving the ergonomics of a workspace.		
Section 1 Study Questions			
	See the study question assignment description document for detailed instructions.	**20**	
Quiz Study Guide			
	Review the quiz study guide before taking the quiz.		
Quiz 1			
	Quiz on Section 1.	**10**	
Assignment 1A			
	See assignment description document for detailed instructions.	**30**	
Assignment 1B			
	See assignment description document for detailed instructions.	**25**	
Section 2: Recording Audio			**15**
Lesson 1: Analog Recording Technology			
	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.		
Lesson 2: Digital Recording Technology			
	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.		
Lesson 3: Recording Studios			
	Define acoustics.		
	Define different types of recording studios.		
	Define different rooms and equipment in a recording studio.		
	Identify considerations when designing a studio.		
Lesson 4: Echoes			
	Define acoustical problems.		
	Define echoes, and how to deal with them.		
	Generate silence.		
	Add an echo effect.		
Lesson 5: Reverb			
	Define reverb, and how to deal with it.		
	Identify useful GVerb settings.		
	Add a reverb effect.		
Lesson 6: More Acoustical Problems			
	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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Section 2 Study Questions			
	See the study question assignment description document for detailed instructions.	**20**	
Quiz Study Guide			
	Review the quiz study guide before taking the quiz.		
Quiz 2			
	Quiz on Section 2.	**10**	
Assignment 2A			
	See assignment description document for detailed instructions.	**30**	
Assignment 2B			
	See assignment description document for detailed instructions.	**25**	
Section 3: Audio Software Tools			**15**
Lesson 1: DAW Software			
	Define and identify features of DAW software.		
	Identify computer requirements.		
	Identify recommended computer hardware.		
	Define DAW-specific hardware.		
	Identify two popular DAW software programs.		
	Identify Audacity's advantages and features.		
	Identify types of software licenses.		
	Read Audacity's software license.		
Lesson 2: Other Audio Tools			
	Define MIDI and its history.		
	Identify MIDI cables and jacks.		
	Define Channel Voice messages.		
	Identify MIDI controllers and MIDI uses.		
	Define and identify looping software and when to use it.		
	Identify how to find audio loops to use.		
Lesson 3: Multitrack Music Project			
	Define syncing.		
	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.		
Lesson 4: Audio File Formats			
	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.		
Lesson 5: Encode Audio			
	Define encoding and constant and variable bit rates.		
	Define metadata.		
	Define LAME MP3 Encoder and FFmpeg Library.		
	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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Section 3 Study Questions			
	See the study question assignment description document for detailed instructions.	**20**	
Quiz Study Guide			
	Review the quiz study guide before taking the quiz.		
Quiz 3			
	Quiz on Section 3.	**10**	
Assignment 3A			
	See assignment description document for detailed instructions.	**30**	
Assignment 3B			
	See assignment description document for detailed instructions.	**40**	
Section 4: Mics and Mixing			**16**
Lesson 1: Microphone Hardware			
	Define microphone.		
	Define transducer.		
	Identify different types of microphone transducers.		
	Identify the parts of a microphone.		
	Define connectors.		
	Define active and passive mics.		
	Define phantom power.		
Lesson 2: Microphone Specifications			
	Define and identify microphone specifications.		
	Define frequency response.		
	Define proximity effect.		
	Define transient response.		
	Identify output characteristics.		
Lesson 3: Microphone Placement			
	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.		
	Define direct input box.		
Lesson 4: Using Other People's Music			
	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.		
Lesson 5: Mix Samples			
	Define mixing samples.		
	Download course resources.		
	Identify and remove unwanted audio tracks.		
	Define repeating samples.		
	Define stereo and mono Audacity track types.		
	Add blank stereo and mono tracks.		
	Repeat samples of audio.		
Lesson 6: Finish Mixing Samples			
	Define gain.		
	Change the gain of an audio track.		
	Define pan.		
	Pan an audio track.		
	Split a stereo track into two mono tracks.		
	Combine two mono tracks into a stereo track.		
	Define envelope and the Envelope Tool.		
	Use the Envelope Tool to modify an audio track's envelope.		

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Section 4 Study Questions			
	See the study question assignment description document for detailed instructions.	**20**	
Quiz Study Guide			
	Review the quiz study guide before taking the quiz.		
Quiz 4			
	Quiz on Section 4.	**10**	
Assignment 4A			
	See assignment description document for detailed instructions.	**30**	
Assignment 4B			
	See assignment description document for detailed instructions.	**40**	
Section 5: Mastering Sound			**22**
Lesson 1: Mastering and EQ			
	Define mastering and mastering goals.		
	Define audio signal processing.		
	Define equalization and identify its uses.		
	Define positive and negative decibels.		
	Identify ways to use the Equalization Tool.		
	Equalize audio with the Equalize Tool.		
Lesson 2: Continue Using EQ			
	Define the Draw Curves Mode.		
	Use the Draw Curves Mode and draw curves.		
	Identify EQ curve presets.		
	Use the EQ curve presets.		
	Make and save a curve preset.		
Lesson 3: Compress Audio			
	Define level meters.		
	Define and identify the parts of the Meter ToolBar.		
	Define clipping.		
	Read the level meter.		
	Define docking and undocking.		
	Dock and undock the Meter ToolBar		
	Define dynamic range compression.		
	Identify the controls in the Dynamic Range Compressor.		
	Find the peaks in an audio track.		
	Compress audio.		
Lesson 4: Normalize and Fade			
	Define normalization.		
	Define Normalize Effect.		
	Normalize audio.		
	Define fading, fade in, fade out, and crossfading.		
	Fade and crossfade sound.		
	Define Silence Audio Command.		
	Silence audio.		
Lesson 5: Phaser and Wahwah Effects			
	Define phaser and Phaser Effect.		
	Add a Phaser Effect.		
	Define wahwah and Wahwah Effect.		
	Add wahwah to audio.		

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Section 5 Study Questions			
	See the study question assignment description document for detailed instructions.	**20**	
Quiz Study Guide			
	Review the quiz study guide before taking the quiz.		
Quiz 5			
	Quiz on Section 5.	**10**	
Assignment 5A			
	See assignment description document for detailed instructions.	**30**	
Assignment 5B			
	See assignment description document for detailed instructions.	**70**	
	Total	**500**	**90**

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