

DESN 275 Digital Sound Unit 1

Assignments:

- Read ch 1 in Sound Design. Be prepared to discuss reading questions.

- Read the following topics in the Mixing Engineer's Handbook: A/D converter, sample rate, pulse-code modulation, AIFF, WAV, data compression, lossy codecs MP3 and AAC, WMA, Ogg Vorbis

- Download Audacity and LAME to your machine

- Turn in a step-by-step list of instructions for setting the sound input source and output for your personal computer. If you do not have a computer of your own, do it for a machine in our CEB labs. This means how to tell your operating system which input device to record from and which output device to playback to.

- Learn how to use FTP and upload a sound file successfully.

Audacity Assignments:

- First download a version of Audacity for your operating system, and a copy of LAME at <http://audacity.sourceforge.net/download/>

- Using the Audacity User Guide and On-Line Manual, become familiar with the following processes: opening a wave or aiff file, importing an mp3 file, loading a second file into a second or third track, play stop or rewind a sound, selecting a portion of or the file with either the selection tool or the selection menu options for editing, trimming out a portion of a sound file, adding a fade in or fade out, changing the level of the sound up or down (amplify), making the volume rise or fall over sections of the sound, and exporting the sound as an MP3.

- Fix the supplied narration by filling in any missing words and shortening the overly long pause. Make certain the level is constant. Remove useless silence. Save it as MP3 with the following naming convention: yourNameWk1As1.mp3, and turn it in.

"Watch it mates! That main mast is too heavily loaded. Another gust like the last one will snap it like a toothpick! It's time to furl the topsail or we'll shiver our timbers, certain."

- Using only sound files from our class web site, create an interesting 10-second collage. Save it as MP3 with the following naming convention: yourNameWk1As2.mp3
Our FTP site is www.technology.ewu.edu. The username is **s69** and the password is **overtone**.

- Turn in the in-class lab activity.

Reading / Lecture study questions chapter 1 Sound Design

Physically, what is sound?

Physically, what is meant by production, propagation, and perception?

What causes **resonance**?

What are sound wave compression and rarefactions?

What is psychoacoustics?

What is pitch? What is loudness?

Are **loudness** and **amplitude / level** the same thing? (Answer: *Loudness is perceived and depends on many factors such as frequency, whereas amplitude is simply the maximum sound pressure compared to neutral atmospheric pressure.*)

Why is perceived volume affected by frequency, pressure, harmonics, surface properties of the space, and duration?

What is the fundamental frequency of a sound?

What is the timbre of a sound? (*Quality given by the amount and type of overtones.*)

What do overtones look like on a waveform?

Why do we compare waveforms to sine waves?

What is a periodic waveform? A complex periodic waveform?

Explain sound frequency using the term "cycles." What are Hertz (Hz)?

What is the general range of human hearing (that is for those people who have not worked in construction, have not owned a big car stereo, and have not attended rock concerts or trap shoots without earplugs)?

In typical musical tones, what % of the total sound heard is represented by the fundamental tone? (50%)

What do dogs hear that you can't hear?

Note that in Table 1-2 you are shown fundamental frequency ranges, not considering overtones. What is the fundamental frequency range of a typical male voice (baritone)? *110-425 Hz* Of a typical female voice (contralto)? *200-700 Hz* Of a bass guitar or double bass? *40-200 Hz* Of a piano? *28-4100 Hz* Of an alto saxophone? *125-900 Hz*

Why might RMS be a better way to measure loudness than peak-to-peak?

Why does it make sense to measure sound intensity in **decibels**, considering it is some logarithmic math thing that sounds kind of complicated?

How many dB do you think would represent the difference between a quiet media background sound and a very loud one?

If you want sound 1 to seem to be twice as far away from the listener as sound 2, how much quieter should sound 1 be in dB?

What is the relationship between wavelength and frequency?

Explain the parts of a sound envelope: attack, decay, sustain, release.

If you were preparing sound for a scene in a subway, would you mostly want to create the effect of reflection, scattering, or absorption?

Explain why sound sources that are either in-phase or out of phase change the amplitude of the sound.

From the Mixing Engineer's Handbook
What is an A/D converter?

What is meant by sample rate?

What is meant by pulse-code modulation?

What are the basic characteristics of the following typical types of sound files?

AIFF

WAV

Lossy codecs MP3 and AAC,
WMA, and Ogg Vorbis

Vocabulary from Class. Be able to explain each.

Cycles, Waveform, Wavelength, Frequency

Interference of sound waves, Beats

In phase, out of phase

Formants, Harmonics, Overtones

The sound envelope

Reflection, Absorption, Diffraction, Resonance

Amplitude

Decibel

White and Pink noise

Loudness

LAME

Amplify

Clipping

Sine waves and sawtooth waves

What are the characteristics of a good mixing / listening room?