***DESN 275 Digital Sound for Week 3***
**Read** Audio Engineering 101 Chapter 3
**Read** Linked Reading: Noise Reduction Tools and Techniques.

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***Assignment 1: Fix a sound file***
Remove the pops and clicks from the assigned recording. Use the EQ to gently restore the perceived frequency bandwidth, if possible without leaving any obvious artifacts. Turn in as an MP3.

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***Assignment 2a and 2b: Fix a sound file – Thursday*** (This assignment is worth the most points.)
Reduce/Remove the fan noise from the waitress scene dialog track. Create two versions, one that emphasizes noise reduction (but still with intelligible dialog), and one that emphasizes retaining dialog quality. Also reduce the length of the track to about 20 to 30 seconds with all the important dialog. Turn in as an MP3.

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***Assignment 3: Improve a sound file*** - You are given an old music file that was recorded on a cheap cassette recorder. Use your skills to improve it so that it sounds more balanced across the frequency spectrum, even when played over inexpensive computer speakers. Turn it in as an MP3.

*Suggestions for Assignment 3*
*1. Try using a compressor on the track to help support the instruments in the background.*
*2. Since it is stereo, try editing each channel separately, or even duplicate one the channels into a third track that you can edit with EQ to bring out an almost hidden instrument.*

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***Assignment 4: Remove a bell noise***
If the Adobe Audition software is available in the lab, use it to remove the sound of the bell in the background of the interview track.

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**Study Questions on EQ - Equalizing Sound**
What are the six general uses for EQs?

Which frequency range would you try to adjust if the sound was too harsh, too brilliant, too heavy/boomy, or not warm enough?
*( too harsh 500 Hz too brilliant 10K Hz*
*too heavy/boomy 40 Hz*
*not warm enough? 200 Hz)*

Which frequency range usually needs careful adjustments because the human ear is most sensitive to this range? (*1K-3K)*

What is usually better with EQ, *cutting* or *boosting*, and why?

If you were given a sound file that needed EQ help, could you sketch an EQ "curve" that would probably solve the problem?

What EQ would you use to make a sound *stand out* in a mix?

What EQ to make a sound *blend in more*?

What does a *spectrum display or analyzer* tell you?

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**Questions on Spatial Effects**
What do these settings do to the sound?

| | |
|---|---|
| Delay | Reverb Time |
| Damping | Bandwidth |
| Dry – Wet | Hall – Room – Plate |

What physical characteristics of a room affect reverb time?

Why might you want to EQ the *reverb*?

What does reverb do to an instrument or object sound's *placement* in a stereo mix?

Does reverb change the original sound? Explain

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**Questions *on Psychoacoustics and dB***
What options would make a particular sound seem loud to a listener?
*Loudest frequency range?*
*Relative to other sounds in the mix?*
*Adding overtones in what frequency range?*
*Hold the level up, avoiding quiet passages.*
*Frequencies too low for the system to reproduce?*
*Arrangement of sounds left to right.*
*No other sounds have the same frequency content.*

What options do you have to fix sound masking in a mix?

What is the smallest change in loudness that a person can generally detect?

How many dB decrease makes a sound seem like it is coming from twice as far away?

How many dB boost makes a sound seem twice as loud?

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**Textbook Chapter 3 EQ Points of Interest**

What is actually happening when a sound is equalized?

When you boost or cut an EQ band, the frequency that is boosted or cut is called the peak frequency. What are the frequencies on either side of the peak frequency called? (*Slope or Q)*

If you are increasing the Q of an equalizer band, what are you actually affecting?

What exactly does a low-cut filter do?

What exactly does a high-cut filter do?

How can you best use an EQ to create a clear, more-defined mix? *(Use subtractive EQ on what you don't need to hear, rather than boosting everything you want to stand out.)*

Which frequencies generally affect the following qualities?

*Airy – breathy – Chimey - 10K Hz*
*Bigger – fatter – 100 Hz*
*Bite – 1000-3K Hz*
*Boxy – hollow – 300-700 Hz*
*Fat guitar sound – 20-250 Hz*
*In your face – 1000 Hz*
*Muddy – Boomy 100-300 Hz*
*Muffled – too much 100-250 Hz*
*Nasally – too much 500-3K Hz*
*Sibilance – 4K-10K Hz*
*Thin – too much above 4K Hz*
*Tinny – too much 2K-7K Hz*
*Warm – abundant 100 – 400 Hz*

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***Questons from Linked Reading***
***Noise-reduction Tools and Techniques***

Gates are only really effective on what kinds of noise problems?

When is the complete removal of noise counter-productive?

Masking works only when the frequency range of unwanted noise matches what?

What typical problems come up when using noise "fingerprints" to guide digital noise reduction software?

What frequencies is AC "hum" associated with?

A narrow filter can be used to cut unwanted hum frequecies. Why is a "narrow" band filter best?

Why is "amp buzz" more of a problem?

What are the basic pieces of advice given at the end of the article?