

# DESN 275 Final Exam Questions

## Winter 2011 -

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### Physics of Sound

Physically, what is sound?

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

What causes enclosure *resonance*? Is it different than a resonance control on a synthesizer?

What does perception affect what we hear?  
Frequency and compression seem like *loudness*.  
Sounds can mask each other.  
Making something seem louder involves actually quite a bit of level increase. (hence dB)

What is *pitch*? What is *loudness*?

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

What is the fundamental frequency of a sound?

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

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*

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

Explain sound frequency using the term "cycles."

What are Hertz (Hz)?

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

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? -6dB

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

If you were preparing sound for a scene in a subway, basement, bedroom, log cabin, etc, 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.

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Vocabulary from Class. Be able to explain each.  
Interference of sound waves, Beats  
In phase, out of phase  
Formants, Harmonics, Overtones  
White and Pink noise  
Amplify  
Clipping

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### Monitor Speakers

Terms: near or close-field,  
de-coupling the speaker,  
frequency balance,  
crossover

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

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### Analog Recording and Reproduction

What are three significant differences between a *dynamic* microphone and a *condenser* microphone?

What is *phantom power*?

What are *ribbon* microphones famous for?

What do these microphone directionality terms mean?  
Omnidirectional    Cardioid

What does a *pop filter* do?

What is the difference between *balanced* and *unbalanced* cables? Which one has 3 connectors? Which is better?

What is the definition of *frequency response* for microphones? For speakers (monitors)?

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### Alesis USB Manual.

How to set levels on a mixer or other interface for recording?

What is a simple computer recording setup? p17

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### Editing

Why are zero-crossing points important when editing?

What is reverb really?

What is a noise gate? What is a compressor?

What is normalizing?

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### Mixing

What do "tall, deep, and wide" mean in a mix?  
*Low to high frequencies are still present*  
*Reverb places elements front to back*  
*Stereo pan*

What are the signs of an amateur mix?  
*No contrast (usually verse to verse)*

*Holes without fills (focal point)*  
*Noisy mixes - breaths, clicks, rattles*  
*No clarity nor punch - not distinct*  
*No intimacy - too much reverb*  
*Inconsistent levels*  
*Boring elements - overused stuff?*

How do you keep elements/tracks from fighting?

*Turn one off - move apart in pan*  
*EQ uniquely*  
*Limit the number of elements*  
*Turn one down*

What are a couple of elements that most mixers generally agree they start with?

*Bass + Drums*                      *or Vocal/lead*

What is usually panned to (near) the center in music?

*Lead vocal - kick - bass*

What should you pan all the way left or right?"

*Probably nothing! (nothing important)*

What are the three primary goals of EQing?

*Make element clearer, better defined*  
*Make element sound bigger*  
*Make elements work together*

What general frequencies represent the...

*Bottom - kick drum - 63Hz*  
*Boom - warmth - bass - 125Hz*  
*Fullness - mud - 250Hz*  
*Honk - body - boxy - 500Hz*  
*Upper voice - crunch - brightness - 2kHz*  
*Edge - 4kHz*  
*Sibilance - brittleness - sparkle - 8kHz*  
*Air - 10-16kHz*

What are the six general uses for EQs?

- *Adjusting timber of instrument, voice, mix ...and of effects such as echo!*
- *Massaging a track to make it mix better*
- *Eliminating a steady state noise*
- *Fixing a poor recording (a little)*
- *Making a recording sound better over a particular speaker system (Compensating for speaker limitations)*
- *Compensating for room acoustics*

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*

What is usually better with EQ, *cutting* or *boosting*, and why? *Cutting because less distortion introduced*

If you were given a sound file that needed EQ help, be able to sketch an EQ "curve" that would roughly match one that you would use on Audacity's EQ tool to solve the problem, and provide the EQ help.

What are *inserts* in a DAW mixer?

What are *sends*?

What is a *sub-mix*?

What is a *render*? What is a *bounce*?

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### **Spatial Effects**

Describe *delay*, *echo*, and *reverb* (also called *reverberation*).

What do these settings do to a reverb sound?

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

How can delay and reverb help you simulate room size and surface types?

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

Does reverb change the original sound? Explain

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### **Compression**

What is dynamic range?

Be able to explain what a compressor does.

What is a threshold? What is the ratio?

Be able to explain what a limiter does.

What is gating? What are a couple examples of situations in which it would be needed?

What is the goal when adding compression to a bass guitar, a lead vocal, or a snare drum?

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**Garage Band** (and common to all loop editing software): how to choose tempo, type of rhythm, time signature; how to select and loop an instrument; how to edit a loop; the differences between a "software" instrument and "real" instrument; how to move and arrange clips in the timeline; how to adjust levels, pan, and add effects such as reverb and compression; how to add a track, change a track's instrument, how to drag in an audio file created in another program; and how to export the final rendered file.

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### **Sound Design**

What are the EQ characteristics of cinema soundtracks?

What is a "Sound Map"?

What is an example of an **environment sound**?  
*Nighttime, busy street, etc*

An **action sound**?

*Footfalls, doors. Things the character does*

An **object sound**?

*Cars, thunder, wind, equipment*

How do we use adjectives in a sound map?

*As design hints*

*"Lively, fun, subdued, raucous, etc"*

What are examples of emotions that would make sense in

a sound map?

*Fear, love, surprise, loneliness*

What are examples of physical or dramatic transitions?

*Something is about to change  
Moving to a new location*

What is a leitmotif?

Why do film soundtracks prefer a center channel?

*Keep the phantom center from moving*

What basic guidelines are good for the beginning sound designer to use?

*Plan first. Organize all your files. Then begin.  
Never overpower the dialog/narration.  
Add a little space before and after elements.  
Allow environmental sounds to set the scene.  
Remember fade in/outs where appropriate.  
Listen on more than one playback system.  
Don't allow yourself to be silly.*

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## Music

What is a musical octave? How are the frequencies of two notes an octave apart related?

What is meter?

*an identifier like 4/4 telling how many beats in a measure / the kind of note assigned to each beat (full, half, quarter, etc.)*

What is an interval?

In the 12-half-steps between octaves, how many half-steps are there in the following intervals, and what do they typically signify emotionally?

flatted second	1	big problem, Jaws
second?	2	tension
flatted or minor third?	3	blue - sad
third or major third?	4	interesting
fourth?	5	richer
fifth?	7	consonant
Octave?	12	peaceful

What does it mean to *change key*?

What would you do with a sound tool called **transpose**?

Blues often use common chords built on **which notes in the major scale**? Answer: 1, 4 and 5

What are some of the *guidelines* we discussed in class to help us support visual media with musical notes?

*Low Tones - heavier, more important  
Rising Tones - about to happen  
3/4 Time - graceful  
Speeding up - rising anticipation*

How does music **resolve**? In a media project, what is an example of when would you want it to resolve?

*Resolving refers to getting back to the first chord. It sounds like the listener is taken "back home."*

What should we remember about EQ if we have two sounds with *similar frequency ranges* that occur at the *same time* in a media project?

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## Loop Questions

What is a loop? What is the difference between a loop and a short recorded musical passage?

What are the differences between a "software" instrument and "real" instrument? Which one can you transpose the most? Which one lets you change individual notes? Which one is an actual recording?

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## Digital Sound Files

What is meant by sample rate?

What is meant by pulse-code modulation?

## Describe the following sound file formats:

PCM, AIFF, WAV and AU  
TTA and FLAC  
MP3 and Ogg Vorbis  
WMA and ACC  
Real Audio  
MIDI

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## Synthesis

What is an additive synthesizer?

What is a subtractive synthesizer?

What is a sampler synthesizer?

How can you incorporate a synthesizer in a multitrack project?

How can you best set up and manage your computer when recording and editing complex digital sound projects?

*Take it off line - tell it it is off line!  
Have no other software running - reboot  
Record to a separate hard drive than the apps  
Fast speed with large buffer  
Apps record to memory if they can - lots of RAM  
Mute unnecessary tracks when recording new  
Buss effects such as reverb*

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## Mastering

How is mastering different from mixing?

If you are bringing files to a studio to be mastered, what are four good pieces of advice?

*-Have a good mix to start with.  
-Play your mix at home, in car, everywhere, first  
-Don't do lots of compression. Let them do that.  
-Bring an example of a project you like.  
-If unsure, bring two versions of your mix.*