STUDY SHEET FOR MIDTERM
MUSIC 306

The midterm exam will cover the following items:

1. Chapters in book:
(Modern Recording Techniques, 5th edition)

Chapter 1	Breeze through
Chapter 2	**Study**
Chapter 3	Skip (read later if you build a studio)
Chapter 4	**Study** (you can skim the section on particular microphones)
Chapter 5	Skip (unless you're interested)
Chapter 6	**Study** p 177-192,197-199, 210-214 skim the rest
Chapter 7	Skip (will be covered in 307)
Chapter 8	Skip (unless you work in film)
Chapter 9	Skip (unless you're interested)
Chapter 10	Skip (unless you're interested)
Chapter 11	Read
Chapter 12	Read later (not on midterm)
Chapter 13	Skip (unless you're interested)
Chapter 14	Skip (unless you're interested)
Chapter 15	Skip (unless you're interested)
Chapter 16	Read
Chapter 17	Skip

2. Labs 1 and 2

3. Class recording sessions

Some highlights:

CHAPTER 1 – INTRODUCTION

What is a transducer, what is the recording chain?

CHAPTER 2 – SOUND AND HEARING

Waves, propagation, Sinusoids

Amp, freq, velocity, wavelength, phase, harmonic content, envelope

Beats, masking

Reflection, diffraction, localization

Freq response

Time domain vs. freq domain

dB! 10 log vs 20 log

Fletcher-Munson curves

$v = f \lambda$ Use this to compute wavelengths, etc.

At room temperature (68° Fahrenheit), the velocity of sound is:
344 meters/second = 1,128 feet/second = 769 miles/hour

$f = 1/T$

$A*2^{i/12}=B$

$10*\log I_1/I_2$

$20*\log P_1/P_2$

$\text{Log}(A*B)=\log(A)+\log(B)$

$\text{Log}(A^{2/3})= 2/3\log(A)$

$\text{Log}_B(X)= \log_{10}(X)/\log_{10}(B)$

dB -- basic understanding and working knowledge

The "intensity" of a tone is increased by a factor of 10,000. What is this in terms of dB?
The "sound pressure" of a tone is increased by a factor of 100. What is this in terms of dB?

Hearing in stereo

Image positioning by amplitude or time difference

diffraction, reflection of sound, acoustic shadows

propagation of sound

perception of sound: Fletcher-Munson curves.

What is the most sensitive range of frequencies?

What does this have to do with speech?

If you had 20 bits to represent a digital signal,
what would the signal-noise ratio be in dB (sound pressure)?

A mic is placed one foot from a concrete wall. Explain why this might be a bad set up.
In your explanation refer to frequencies that you would expect to have trouble with.

CHAPTER 4 MICROPHONES: Design and Application

Microphones, types (dynamic, ribbon, condensor, electret) and how they work,
Phantom power,
transient response, freq response

directionality, sketch pattern = $A + B \cos \Theta$

Type	A	B
Omni	1	0
Subcardioid	0.25	0.75
Cardioid	0.5	0.5
Supercardioid	0.66	0.33
Hypercardioid	0.75	0.25
Figure of eight	0	1

critical distance

stereo miking techniques

- spaced omni (AB)
- coincident cardioid XY, one-point stereo
- spaced cardioid
- Mid/Side (M+S, M-S)

Recording angle, "hole-in-middle"

CHAPTER 11 THE AUDIO PRODUCTION CONSOLE
Mixers – faders, pan, routing, busses, EQ, Aux send
Cables – RCA, XLR, Phono (1/4 inch and mini, mono and stereo), TRS, S/PDIF, Balanced, unbalanced

CHAPTER 6 DIGITAL AUDIO TECHNOLOGY
Nyquist, quantization, sampling rate, aliasing, etc.

CHAPTER 12 SIGNAL PROCESSORS
EQ, filters, etc (not on exam)