

025:250 COMPOSITION: ELECTRONIC MEDIA I

Fall 2009

Basics of Acoustics

1. Acoustics can be divided into 5 main topics:
 - a. Physical features of sound pressure waves in a room
 - b. Sound recording and reproduction
 - c. Timbre Theory
 - d. Tuning Theory
 - e. Perception and Cognition
2. Overview of pressure sound waves
 - a. Vibration as sound, expressed in hz.
 - b. Waveforms, sine, sawtooth, square
 - c. Interference of waveforms: constructive, destructive
 - d. Phase
 - e. Effects of room on phase
 - f. Comb filter effect
3. Sound recording and reproduction
 - a. Sampling theory
 - b. ADC
 - c. DAC
 - d. Diagram of soundfile recording into a computer
 - e. Diagram of soundfile playback into a concert hall
4. Timbre Theory
 - a. Fourier analysis
 - b. Harmonics
 - c. Filtering
 - d. EQ
5. Tuning Theory
 - a. Basic terms: semitone, octave, cents
 - b. 12th root of 2 = 1.0595
 - c. Octave numbering system, where C4 = middle C = 261.65 hz
6. Perception and Cognition
 - a. Spatial cues
 - b. Stream segregation
 - c. Auditory illusions