

Tech 275 Digital Sound - Syllabus

Course Description

This course provides a foundation in the techniques of sound design, recording, production, and editing, for digital audio media. Students will understand the physics of sound, audio and audio editing terminology, and the digital processes used to transform sound. Students will both create and record sound files, and edit and produce a variety of multimedia audio elements using typical digital technology. Applicable uses include musical entertainment products, web site enhancements, games, sound tracks for video/film, multimedia products for promotion and learning, and virtual worlds.

The course will meet for four hours per week for lecture and guided interactive demonstrations. Appropriate systems are provided in the classroom. Students may be encouraged to work on many assignments as partners. Assignments will require access to computers with specific software installed and occasionally specific hardware installed. CEB labs will be available for homework assignments during the week, possibly including weekends. See posted schedules for availability. Some assignments will require checking out EWU equipment on a day-to-day schedule from the instructor. Audacity, Studio One, and Traktion software are available for free download, allowing the student to complete assignments on their own computers.

Students must acquire their own headphones. Please consult the instructor, as poor headphones tend to produce poor products.

Assignments and Tests

Assignments will be given weekly. Tests will be given approximately every other week. Grading will be based 60% on assignments and production work and 40% on test scores. Grading will follow EWU standards, with 97% points = 4.0

Text Timothy Dittmar: Audio Engineering 101

Turning in Assignments

Due to the large size of digital audio files, we will use FTP to turn in assignments. We will share an FTP site at www.drbraukmann.com. The username is **stus1** and the password will be given to you in class. Your instructor will be happy to help you get started.

If you are unable to upload your assignments via FTP, as a last resort burn a CD to give to your instructor. Most assignments must be submitted in a compressed format. MP3 is recommended. Please note the course work becomes more difficult if you get behind on assignments.

Instructor Dr. James Braukmann,
jamesbraukmann@gmail.com, CEB 125 Studio

Topical Outline

Unit 1 Sound Waves, Acoustic Environments

- Physics of sound waves, waveforms, overtones and harmonics, frequency and pitch, levels, beats, attack, decay, sustain, release, decibels, types of noise
- Chamber characteristics, reflection, absorption, transmission, resonance, echo, reverberation
- Loudness and psychoacoustics
- Intro to software (*Audacity first, then Studio One*) set up, typical editing operations and file formats, and introduction to fundamental editing techniques
- Simple sound generation
- Monitoring headphones & speaker technology & performance

Unit 2 Digital Audio Fundamentals

- Sampling, resolution, clipping, signal to noise ratio, digital audio file types, compression schemes, optimization
- Digital editing fundamentals, introduction to sound effects: creating new sounds, fixing sounds, combining sounds, etc. multiple tracks
- *Sound design* for film and video, Foley

Unit 3 Recording and Reproduction Equipment

- Options for bringing sound into a computer: A-D / D-A converters, mixers, microphones, speakers, etc.
- Introduction to live recording and Foley

Unit 4 Sound Generation – Virtual Instruments and MIDI

- Music fundamentals: pitch, intervals, keys, scales, transposition, beats and tempo, bars, loops, keyboard interface
- Survey of software and hardware synthesizer operation, real and virtual instruments, additive and subtractive synthesis, vocoders, modulated waveforms, samplers, MIDI and loop editors

Unit 4 Multi-track Editing and Introduction to Mastering

- File organization, mixing, dimensional editing, compression, etc.
- Intro to Production Editing Software (*Logic Express*)
- Set up, typical editing operations and file formats multitrack editing and mastering, etc.

Unit 6 Sound Designers Introduction to Music Theory

- The emotional communication of pitch intervals, tempo, time signature, creating and resolving tension