



**Arts and Communication Division**

**Course Outline**

**MUS 230 Introduction to Digital Audio Production**

**Coordinator: James Kelly**  
**Latest Review: Spring 2005**  
**Ext. 3716**

**Description:** An introduction to music technology with an emphasis on music production utilizing a computer-based digital audio workstation. Topics will include MIDI, digital recording and editing, synthesis, and music production. Students will develop skills with regard to performing, recording, mixing, and mastering music and will present a final project in the form of a recorded musical production. Students will be required to work outside of class time to produce a final project.

**A. General Objectives:**

1. Students will demonstrate knowledge of audio physics, MIDI, synthesis, digital audio and signal processing.
2. Students will develop skills with regard to performing, recording, mixing, and mastering music and will present a final project in the form of a recorded musical production.

**B. Specific Objectives:**

1. Students will demonstrate the ability to record, sequence, edit, mix, and master a musical project using a digital audio workstation.
2. Students will perform music using a keyboard, synthesizer, drum machine, and MIDI sequencer.
3. Students will perform music using live instruments and voice for the purpose of their recording.
4. Students will be responsible for organizing and managing productive sessions, as well as demonstrating professional attitude and demeanor.
5. Students will present a final recorded project on the last day of class.

**C. Principal Resources:** The course will be taught in the existing Macintosh computer lab. Each workstation will be equipped with Digidesign Pro Tools software and hardware, a MIDI keyboard controller, synthesis software, and headphones. The lab will be equipped with several studio-quality microphones for the recording of live vocals and instruments. Students will be required to purchase the textbook *Modern Recording Techniques*, Fourth Edition, by Huber and Runstein. Students will also be required to purchase a blank CD-R for the recording and submission of the final project.

**D. Method of Instruction:** The course will be taught in a lecture/lab format. Students will meet for 2 hours per week in a classroom setting to receive lectures and demonstrations pertaining to course content. They will be required to complete exercises and a final project during two weekly hours of computer lab time

**E. Evaluation Procedures:** The final project will constitute 50% of the final grade and will be evaluated in terms of completeness, effort, and appropriate sonic and musical aesthetics as determined by the instructor. The remaining 50% will be determined by a mid-term exam and several quizzes that will test student knowledge with regard to terms and concepts covered in the lectures. A= Excellent, B= Above average, C= Average, D= Below average, F= Failing

**F. Topical Outline:**

1. Physics of Sound
2. Electronic Music Synthesis
3. Fundamentals of Digital Audio
4. Introduction to MIDI
5. Signal Processing
6. Reverberation and Time Domain Processing
7. Equalization and Frequency Domain Processing
8. Compression and Amplitude Domain Processing
9. Microphone Theory and Technique
10. Overview of Computer-Based Digital Audio Workstations
11. Introduction to *Pro Tools* Digital Audio Application
12. Recording Audio
13. Editing Digital Audio
14. MIDI Sequencing and Editing
15. Digital Signal Processing
16. Mixdown and Mastering
17. Final Project - A Pro Tools production demonstrating skills with MIDI and digital audio recording, editing, and mixing.

## **G. Outline by Week:**

Week 1 - Review course syllabus. Discuss project requirements, tests, grading, and lab procedures. Introductory overview of digital audio production.

Week 2 - Physics of sound. Topics to include: Sound waves, waveform characteristics, reflection, frequency response, phase, harmonic content, loudness levels and the decibel, the ear and human hearing, beats, combination tones, directional and spatial perception, masking and reverberation. Reading assignment: *Modern Recording Techniques*, Chapter 2 - Sound and Hearing, Chapter 3 - Acoustics.

Week 3 - Introduction to electronic music synthesis and digital sampling. Topics to include: sampling, quantization, digital recording process, hard disk recording, sample editing, fades and crossfades, additive synthesis, subtractive synthesis, envelopes, and oscillators. Introduction to Pro Tools. Hands-on computer demonstration and student exercises. Reading assignment: *Modern Recording Techniques*, Chapter 6 - Digital Audio Technology, and Electronic Music Synthesis (handout).

Week 4 - MIDI. Topics to include: system interconnection, MIDI in, out, and through, daisy chain, MIDI channels, channel, system, and system-exclusive messages, sequencing, MIDI interfacing, and software packages. Introduction to Pro Tools MIDI applications. Hands-on computer demonstration and student exercises. Reading assignment: *Modern Recording Techniques*, Chapter 7 - MIDI and Electronic Musical Instrument Technology.

Week 5 - Signal processing. Topics to include: time domain processing, reverberation, delay, chorusing, flanging, frequency domain processing, equalization, amplitude domain processing, compression, gating, expansion, noise reduction. Hands-on computer demonstration and student exercises. Reading assignment: *Modern Recording Techniques*, Chapter 11 - Signal Processors.

Week 6 - Microphone design and technique. Interfacing a microphone with Pro Tools. Microphone gain structure. Hands-on demonstration and student exercises. Reading assignment: *Modern Recording Techniques*, Chapter 4 - Microphones: Design and Application.

Week 7 - Review

Week 8 - Mid-term Exam

Week 9 - Overview of computer-based digital audio workstations. Pro Tools review. Advanced Pro Tools recording and MIDI applications.

Week 10 - Student project forum. Advanced Pro Tools editing.

Week 11- Student project forum. Pro Tools signal processing.

Week 12 - Student project forum. Pro Tools mixdown.

Week 13 - Student project forum. Advanced mixing concepts.

Week 14 - Student project forum. Mastering.

Week 15 – Project evaluations.

Week 16 – Project evaluations and final exam.