

COURSE OUTLINE

Music 178 Introduction to Recording and Digital Audio Production

Catalog Statement

MUSIC 178 offers an introduction to sound recording, acoustics, digital audio, and signal processing. Students learn audio terminology, audio hardware operation, digital audio workstation (DAW) operation, and audio engineering techniques. Hardware is studied including microphones, cables, monitors, recorders, consoles, and signal processors. Students experience hands-on use of current music production hardware and software. Students also learn about recording studio procedures, jobs in the recording industry, mixing techniques, mastering, post production, and the product manufacturing process.

Total Lecture Units: 3.0

Total Laboratory Units: 0.0

Total Course Units: 3.0

Total Lecture Hours: 48.0

Total Laboratory Hours: 0.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 48.0

Prerequisite: None.

Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

N/A

Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

- summarize the different roles and processes involved in recording;
- summarize signal processing techniques;
- explain microphone designs, characteristics, and applications;
- describe current audio recording procedures;
- explain sound, hearing, and acoustics concepts;
- discuss the differences in studio types and designs;
- explain the processes and equipment involved in analog recording;
- explain the processes, hardware, and software used in digital recording;
- explain current audio formats;
- describe audio console operation and basic mixing concepts;
- discuss speakers and monitoring concepts;
- summarize the mastering process and mastering techniques;

- recognize current methods of audio product manufacturing.

Course Content

Total Faculty Contact Hours = 48.0

Overview of Modern Recording Industry (2 hours)

- Industry role of recording studios
- Recording industry jobs
- The recording process

Sound and Hearing (4 hours)

- Basics of sound
- Waveforms
- Loudness levels
- The ear and auditory perception
- Psychoacoustics

Studio Acoustics and Design (2 hours)

- Studio types
- Studio and control room acoustics
- Design factors in studios

Microphones (6 hours)

- Microphone designs
- Microphone characteristics
- Microphone preamps
- Microphone selection
- Microphone techniques and applications

Analog Tape Recording (2 hours)

- Magnetic recording and media
- Components and design of analog tape recorders
- Operation of analog tape recorders
- Maintenance of analog tape recorders and media

Digital Audio (3 hours)

- Basics of digital audio and the digital language
- Digital recording and reproduction process
- Digital recording systems

Digital Audio Workstations (DAW) (3 hours)

- DAW hardware
- System connectivity
- Audio interfaces
- DAW controllers
- DAW software
- Sound file formats
- Optimizing DAW configurations
- DAW maintenance

MIDI (Musical Instrument Digital Interface) in the Recording Studio (2 hours)

- MIDI in contrast to recorded audio
- System connections and configurations
- MIDI specifications
- MIDI hardware and software

- Sequencing and editing
- Integrating MIDI into the recording process
- Audio Formats and Multimedia (1.5 hours)**
 - Delivery media
 - Delivery formats
 - Perceptual coding
 - MIDI, graphics, and desktop video
- Audio Console Design and Mixing (6 hours)**
 - Analog console designs and functions
 - Digital console technology
 - Virtual DAW mixers and automation
 - Mixing and balancing basics
- Signal Processing (6 hours)**
 - In-line vs. side-chain processing
 - Equalization
 - Dynamic processing
 - Time-based signal processing
 - Hardware vs. software based signal processing
- Noise Reduction (1.5 hours)**
 - Analog noise reduction
 - Noise gates
 - Digital noise reduction
 - Audio restoration
- Monitoring (3 hours)**
 - Monitoring environment considerations
 - Speaker design and monitor speaker types
 - Monitoring formats
 - Monitoring techniques in the recording studio
- Surround Sound (1.5 hours)**
 - Surround sound in the recording industry
 - Surround formats and monitoring
 - Surround mixing
- Basics of Audio Mastering (3 hours)**
 - Mastering vs. mixing
 - The process of mastering
 - Signal processing in mastering
- Survey of Audio Product Manufacturing Processes (1.5 hours)**
 - CD (compact disc) creation
 - DVD (digital versatile disc) creation
 - Vinyl disc creation
 - Creation for virtual distribution

Methods of Instruction

The following methods of instruction may be used in this course:

- lecture and demonstration;

- peer review;
- discussion and review;
- active listening and musical analysis;
- multimedia;
- online materials.

Out of Class Assignments

The following out of class assignments may be used in this course:

- reading;
- listening and analysis (e.g. listening to Sgt. Pepper's Lonely Hearts Club Band and providing a description of recording techniques that are heard);
- exercises;
- projects.

Methods of Evaluation

The following methods of evaluation may be used in this course:

- participation;
- project evaluations;
- midterm examinations;
- final examinations.

Textbooks

Huber, Miles. *Modern Recording Techniques*. Oxford: Focal Press/Elsevier, 2013. Print. 12th Grade Textbook Reading Level. ISBN: 9780240821573.

Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- explain the modern recording process and summarize standard roles and procedures that are associated with it;
- demonstrate an understanding of sound, hearing, and acoustics;
- explain microphone designs, characteristics, and applications;
- describe analog, digital and virtual audio console operations and features,
- explain mixing concepts, the mastering process, signal processing techniques;
- describe speakers, monitoring concepts, and audio manufacturing processes.