

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

[CLASS]

[MUSIC]

Expanded Course Outline

Course Subject Area:	MU
Course Number:	4291
Course Title:	Live Sound Production
Units:	3
C/S Classification #:	04
Component:	Lecture
Grading Basis: (graded only, CR/NC only, student's choice)	Graded only
Repeat Basis: (may be taken once, taken multiple times, taken multiple times only with different topics)	Taken once
Cross Listed Course: (if offered with another department)	
Dual Listed Course: (if offered as lower/upper division or undergraduate/graduate)	
Major course/Service course/GE Course: (pick all that apply)	Major course
General Education Area/Subarea: (as appropriate)	
Date Prepared:	12/30/2014
Prepared by:	Arthur Winer

I. Catalog Description

Applied technology and processes used for live sound production and recording in musical productions. Review of acoustics. Historical practices in live sound. Signal processing and noise reduction technologies. Application of consoles, monitoring, microphones, cabling, and microphones in live concert settings.

II. Required Coursework and Background

MU 328 or MU 3281

III. Expected Outcomes

Students will gain the following:

1. Knowledge of terminology used in the live sound industry.
2. Knowledge of the historical practices employed in live sound.
3. Basic understanding of acoustics as it applies concert venues and live sound.
4. Knowledge of the steps involved in producing successful concert events in a variety of settings.

5. Knowledge of the function of the equipment used for sound reinforcement, and under what circumstances the equipment is used.
6. Hands-on experience producing and recording live sound events.

The outcomes of this course relate to the following Music Department Student Learning Outcomes:

#3: Demonstrate musicianship skills (including those involving technology) and conceptual understandings.

#4: Demonstrate and articulate personal growth as a musician and student of music in the world.

#6: Develop specialized knowledge appropriate to the option or emphasis area.

BA in Music:

#3. **Communicate effectively**--verbally and in writing--about specific musical works and musicians, about the creative process in music, and about music's role in human culture.

#5. **Demonstrate and articulate** artistic growth as a musician and student of music in the world.

BA in the MIS Option:

#1. **Interpret** relationships between music and: commerce; technology; media; and audience.

BM in Music:

#1. **demonstrate** a high level of musicianship that facilitates independent preparation of music for performance.

#2. **utilize** current/recent technologies appropriate to the musical endeavor.

#8. **promote** musical culture in the community.

IV. Instructional Materials

Biederman, Raven and Penny Pattison. *Basic Live Sound Reinforcement: A Practical Guide for Starting Live Audio*. New York: Focal Press, 2013.

Hechtman, John and Ken Benshish. *Audio Wiring Guide*. New York: Focal Press, 2008.

Howard, David M. and Jamie Angus. *Acoustics and Psychoacoustics*. 3rd Ed. New York: Focal Press, 2006.

McCarthy, Bob. *Sound Systems: Design and Optimization*. 2nd Ed. New York: Focal Press, 2009.

Swallow, Dave. *Live Audio: The Art of Mixing a Show*. New York: Focal Press, 2010.

Toole, Floyd E. *Sound Reproduction*. New York: Focal Press, 2008.

White, Paul. *The SOS Guide to Live Sound*. New York: Focal Press, 2014.

V. Minimum Student Material

Headphones, 15-question & 50-question Scantrons.

VI. Minimum College Facilities

1. Control room lab/class room, associated with concert venue, and large enough to accommodate monitoring equipment, instructor and students. Digital audio workstation hardware & software. Computer system compatible with hardware. Two hard drives. Computer monitors. Internet access. Off-site server accessible via Ethernet for backing up audio data. Mixing console and/or digital audio workstation controller. Other signal processing equipment. Monitoring systems (speakers, amplifier and gain controller). Studio furniture including computer noise-isolation, equipment racks, speaker stands, console table, and chairs for instructor and students. Analog and digital cabling including patch-bay.
2. Recital Hall or similar concert venue capable of accommodating live concert events. Access to guitar amplifiers, drum kit, and piano. Analog and digital cabling. Assorted microphone collection and microphone stands.
3. Blackboard (or equivalent) on-line site.

VII. Course Outline

1. Overview to historical practices in live sound production and recording.
 - a) Advent analog sound reinforcement technology.
 - b) Digital audio technology.
 - c) Advent of the digital audio workstation
2. Overview of acoustics.
 - a) Sound sources and parameters of sound
 - b) Definition of sound
 - c) Sound harmonic series: partials, overtones, timbre,
 - d) Sound measurement.
 - e) Investigations into issues of acoustics in live sound venues.
3. Review of digital audio workstation.
4. Introduction to the mixer and patch bay.
 - a) Generalities common to both analog, digital and virtual (DAW) mixers
 - b) Introduction to the input strip: auxiliary outputs, buss outs, pan pots, EQ, trim pot, input fader, input select, buss assignment.
 - c) Patch bays: normalization, connection type.
5. Introduction to microphones and speakers (transducers).
 - a) History.

- b) Characteristics: transduction principles; frequency response; pick-up patterns; dynamic, ribbon and condenser types.
 - c) Techniques: History, mono, stereo, mix, multi-track. Impedance, proximity effect, off-axis coloration, acoustic phase cancellation, electronic phase cancellation, spacing techniques, multi-mic techniques, isolation. Instrument-specific mic'ing techniques.
 - d) Monitoring systems for performers, audience, and control.
6. Review of signal processing
- a) Filters and equalization: low pass, hi pass, band pass, band reject, notch filters, slope, cut-off frequency, reject band, pass band, dB/octave, EQ
 - b) Dynamics processing: compressors/limiters; expanders/gates.
 - c) Reverberation and delay units: echo, delay, reverb time.
 - d) Noise reduction technologies employed in live sound.

VIII. Instructional Methods

1. Lectures, student involvement through discussions based on readings, lectures subjects and hypothetical problems.
2. Class divided into groups, each group responsible for working live sound concert events.
3. Group presentation of solutions to problems and/or results of lab activity.

IX. Evaluation of Outcomes

1. Final exam.
2. Short quizzes throughout the quarter.
3. Class and lab participation in live sound concert events.
4. Presentations and papers.