MUSIC181 : Live Sound I

General Information

Author:	• Tobin Sparfeld
Course Code (CB01) :	MUSIC181
Course Title (CB02) :	Live Sound I
Department:	MUSIC
Proposal Start:	Fall 2024
TOP Code (CB03) :	(1005.00) Commercial Music
CIP Code:	(10.0203) Recording Arts Technology/Technician.
SAM Code (CB09) :	Possibly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000608693
Curriculum Committee Approval Date:	11/08/2023
Board of Trustees Approval Date:	01/09/2024
Last Cyclical Review Date:	11/08/2023
Course Description and Course Note:	MUSIC 181 is an overview of live sound reinforcement in the music industry. Students study basic theories of sound system operation, room acoustics, and practical applications and learn setup and operation of sound system components such as microphones, mixing consoles, signal processors, amplifiers, and speakers systems. Students also explore analog and digital mixing and transmission technologies and will participate in hands-on experiences with system design, setup, troubleshooting, sound checking, mixing, and recording of live music events.
Justification:	Mandatory Revision
Academic Career:	• Credit
Author:	• Tobin Sparfeld

Academic Senate Discipline

Primary Discipline:	• Music
Alternate Discipline:	
Alternate Discipline:	

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grading Basis

- Grade with Pass / No-Pass Option

☐ Allow Students to Gain Credit by Exam/Challenge

Pre-Collegiate Level (CB21)

Not applicable.

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

Not Applicable

Transferability

Transferable to CSU only

Transferability Status

Approved

C-ID	Area	Status	Approval Date	Comparable Course
CMUS	Commercial Music	Approved	09/03/2019	CMUS 120 X - Live Sound I

Units and Hours

Summary

Minimum Credit Units (CB07)	2
Maximum Credit Units (CB06)	2
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	54
Total Student Learning Hours	108

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1.5	3
Laboratory Hours	1.5	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	27

Laboratory	27
Studio	0
Total	54

Course Out-of-Class Hours

Lecture	54
Laboratory	0
Studio	0
Total	54

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

MUSIC177 - Introduction To Music Technology (in-development)

Objectives

- Explain the fundamentals of sound including waveforms, frequency, amplitude, and harmonics.

OR

Advisory

MUSIC178 - Introduction To Recording

Objectives

- Explain sound, hearing, and acoustics concepts.

Entry Standards

Entry Standards

No value

Course Limitations

Cross Listed or Equivalent Course

No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion
Methods of Instruction	Multimedia
Methods of Instruction	Collaborative Learning
Methods of Instruction	Demonstrations
Methods of Instruction	Field Activities (Trips)
Methods of Instruction	Guest Speakers
Methods of Instruction	Presentations

Out of Class Assignments

- Reading
- Observation and analysis (e.g. shadowing a live sound engineer as they mix)
- Exercises (e.g. setup microphones and ring out a sound system)
- Projects (e.g. design a sound system complete with full equipment list and setup diagram for a given performance)
- Mixing (e.g. perform as the mains mix engineer for a live concert performance)

Methods of Evaluation	**Rationale**

Activity (answering journal prompt, group activity)	Skill demonstration activities
Project/Portfolio	Midterm project evaluations
Project/Portfolio	Final project evaluation
Exam/Quiz/Test	Midterm examinations
Exam/Quiz/Test	Final examination

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Teddy Boyce	Introduction to Live Sound Reinforcement: The Science, the Art, and the Practice	Friesen Press	2020	9781525565090

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Describe the principles of signal flow as related to live sound.

Describe microphone designs, characteristics, selection, and applications as related to live sound.

Describe signal processing and its applications to live sound.

Explain monitoring and monitoring systems in live sound.

Diagnose and troubleshoot common problems that occur in live sound reinforcement.

Describe the principles of room acoustics and how sound interacts with various room environments.

Recognize the fundamental differences between digital and analog consoles.

Demonstrate a working knowledge of the basic concepts and terminology of live sound reinforcement.

Participate in the design, setup, operation, and teardown of a sound reinforcement system for live music events.

Perform a basic mix for live music events of various genres.

Demonstrate proper equipment care and maintenance procedures and display an awareness of common industry practices.

SLOs

Design a sound system solution complete with all specific needed equipment, cost, connection diagrams, and system placement for a given concert and budget. Expected Outcome Performance: 70.0

Complete a connection of all components of a sound system from a stored state and perform a ringing out procedure. Expected Outcome Performance: 70.0

Perform a successful mains mix of a live music concert with signal chains that include signal processing and sends to a monitor mix. Expected Outcome Performance: 70.0

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Fundamentals of Sound (3 hours)

- Sound waves
- Frequency and Amplitude
- Propagation
- Decibels, signal levels, and intensity levels
- Phase and relationships

Sound and the Audio Environment (1.5 hours)

- Air and the speed of sound
- Reflection, diffusion, and reverberation
- Absorption and diffraction
- Working with the environment

Audio Input Devices (1.5 hours)
- Microphones
- Impedance
- Wireless microphones
- Direct inject (DI) boxes

Audio Output Devices (1.5 hours)
- Loudspeakers
- Drivers, crossovers, and enclosures
- Passive vs. active speakers
- Specifications and speaker selection

Amplifiers (1.5 hours
- Current vs. voltage
- Pre and power amplifiers
- Classifications and power ratings
- Operational options and considerations
- Specifications and amplifier selection

Cables and Device Connections (1.5 hours)
- Balanced vs. unbalanced connections
- Patches, inserts, and direct outputs
- Signal levels
- Troubleshooting mixtures of levels and connection types
- Speaker cables and signals

Digital Audio (1 hour)
- How sound is represented in binary
- Digital vs. analog
- Conversion
- Digital signal processing

Signal Processing and Effects (1.5 hours)
- Equalizers and types of EQ
- Compressors and limiters
- Expanders and noise gates
- Digital delays
- Modulation effects
- Reverberation effects

Analog Consoles (3 hours)
- Overview and layouts
- Inputs and input channels
- Busses
- Grouping
- Main, monitor, and cue mixes
- Inserts, sends, and returns
- Gain structure
- Specifications and console selection

Digital Consoles (3 hours)
- Differences between digital and analog consoles
- Control surface
- Layers and configurations
- Recall and memory
- Digital audio networking
- Advantages of digital

Sound System Design (3 hours)
- Considerations and primary use
- Indoor vs. outdoor
- Mixing position
- Speaker and microphone placements
- Power requirements and issues
- Safety issues

Microphone Usage (3 hours)

- Rules of microphone usage
- Source, distance, phasing, and sound quality
- Handling issues
- Vocal micing
- Instrument and ensemble micing
- Stereo and multi-mic techniques

Pre-Performance Tasks (.5 hour)
- Planning
- Setup and powering up
- Testing, tuning, and ringing out
- The soundcheck

Performance Tasks (1 hour)
- Performance ability and tasks
- Basic mains mixing
- Enhancing the mix
- Monitor mixing
- Recording the performance
- Performance notes

Post-Performance Tasks (.5 hour)
- Powering down and teardown
- Equipment security storage
- Post performance evaluation

Total hours: 27

Laboratory/Studio Content

Analog Consoles (3 hours)
- Overview and layouts
- Inputs and input channels
- Busses
- Grouping
- Main, monitor, and cue mixes
- Inserts, sends, and returns
- Gain structure
- Specifications and console selection

Digital Consoles (3 hours)
- Differences between digital and analog consoles
- Control surface
- Layers and configurations
- Recall and memory
- Digital audio networking
- Advantages of digital

Microphone Usage (3 hours)
- Rules of microphone usage
- Source, distance, phasing, and sound quality
- Handling issues
- Vocal micing
- Instrument and ensemble micing
- Stereo and multi-mic techniques

Pre-Performance Tasks (3 hours)
- Planning
- Setup and powering up
- Testing, tuning, and ringing out
- The soundcheck

Performance Tasks (12 hours)
- Performance ability and tasks
- Basic mains mixing
- Enhancing the mix
- Monitor mixing
- Recording the performance
- Performance notes

Post-Performance Tasks (3 hours)

- Powering down and teardown
- Equipment security storage
- Post performance evaluation

Total hours: 27