RAT-2540: LIVE SOUND REINFORCEMENT

Cuyahoga Community College

Viewing: RAT-2540 : Live Sound Reinforcement

Board of Trustees:
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Academic Term:
Fall 2021

Subject Code
RAT - Recording Arts & Technology

Course Number:
2540

Title:
Live Sound Reinforcement

Catalog Description:
Theory and operation of various live sound reinforcement systems. Includes acoustics, system setup, signal flow, mixing consoles, microphones, signal processing, amps, crossovers and speaker systems.

Credit Hour(s):
3

Lecture Hour(s):
1

Lab Hour(s):
4

Requisites

Prerequisite and Corequisite
RAT-1320 Audio Transducers, or department approval.

Outcomes

Course Outcome(s):
Describe the physical properties of sound.

Objective(s):
1. Identify the physical factors which affect the propagation of sound.
2. Analyze the frequency composition of sound by use of electronic test instruments.
3. Determine the frequency composition of sound through psychoacoustic evaluation.
4. Measure and rank sound phenomena in terms of sound pressure level, corresponding electrical properties and listener perception.

Course Outcome(s):
Understand sound system components.

Objective(s):
1. Classify the types of components employed in various sound system configurations.
2. Detail electromechanical operating principles of sound system components.
3. Explain the function and adjustment parameters of components in various sound system configurations.
4. Recognize situational needs of common sound reinforcement environments and meet the needs through equipment choices.
5. Summarize the interaction of components within a sound reinforcement system.
6. Interpret the technical specifications and performance of components within a sound reinforcement system.
7. Evaluate the suitability and success of system components and the system as a whole.

Course Outcome(s):

Setup a sound system.

Objective(s):

1. Evaluate the coverage needs of the sound system to maximize intelligibility, frequency response and safety.
2. Select the most appropriate technology for a given space and application considering performance characteristics, cost and availability.
3. Construct sound systems utilizing both point source and line array speaker technology.
4. Design the appropriate main house speaker system and auxiliary outputs (out fill, in fill, delay fill and recording/streaming systems) to intended/optimal goals.
5. Interpret stage plot information to accurately deploy and operate stage monitoring equipment for talent's maximum acoustic and psychoacoustic benefit.
6. Recognize and abate common safety dangers in sound system deployment.
7. Deploy microphones to maximize sound quality and system functionality.
8. Understand the needs of artists and talent in order to graphically depict and place sound system components for the particular performance situation.
9. Demonstrate digital and analog multi signal routing scenarios between stage, monitor, front of house and other locations.
10. Recall and construct routing/wiring setups for communication between primary and external processing devices.
11. Demonstrate multiple connection techniques in amplified speaker systems.

Course Outcome(s):

Operate a sound system.

Objective(s):

1. Demonstrate proper and safe power up and power down procedure of electrical sound systems.
2. Recognize and correct feedback problems in sound systems.
3. Demonstrate proper system gain setting technique.
4. Utilize outboard signal processors using parallel and serial routing techniques.
5. Analyze sound system performance utilizing electronic measurement tools, such as decibel meters, rta (real time analysis) and time based analysis.
6. Modify system parameters as needed during performance and rehearsal situations.
7. Execute mixing console parameter manipulation to produce results which maximize sound quality and artistic expression.

Course Outcome(s):

Perform sound system maintenance and troubleshooting.

Objective(s):

1. Identify components that are in good working order or those that need repair or maintenance.
2. Demonstrate mic sanitization techniques.
3. Recognize and correct faults in signal flow, routing and operator error that impact proper sound system performance.
4. Detail steps in loudspeaker evaluation and repair - replacing parts, replacing drivers, etc.
5. Recognize and perform system cleaning (power amps, cables, stage decks, speakers).

Methods of Evaluation:

1. Worksheets
2. Quizzes
3. Written exams
4. Lab practicals
5. Class participation and promptness

Course Content Outline:

1. Sound system components
   a. Microphones
   b. Mixing consoles
   c. Signal processing

   d. Amplifiers
   e. Speakers
   f. Cabling
   g. Sound source characteristics
   h. Physical Space/Acoustics
   i. Listener/Perception
2. Sound system assembly
   a. Speakers
      i. Point source
      ii. Line array
   b. Mixing consoles
      i. Digital Mixers
      ii. Analog Mixers
   c. Microphones
   d. Monitors
   e. Amplifiers and crossovers
   f. Signal processing
   g. Cabling
      i. A.C. power
      ii. Speaker
      iii. Microphone and snakes
   h. System setup and teardown
3. Sound system operation
   a. Mixing consoles
   b. Speakers, amplifiers and crossovers
   c. Signal processing
   d. System tuning
      i. House
      ii. Monitor
   e. Sound checks
   f. Mixing theory
4. Technical
   a. Acoustics
   b. Component specifications
   c. A.C. power
   d. Grounding
   e. Troubleshooting
   f. System maintenance

Resources

Davis, Gary, Jones, Ralph, Yamaha Corp. of America. *The Sound Reinforcement Handbook*. 2nd. Milwaukee: Hal Leonard Publ. Corp., 1990.

Stark, Scott Hunter. *Live Sound Reinforcement*. 1st. Vellejo: Artistpro, 2004.

Bill Gibson. *The Ultimate Live Sound Operator's Handbook*. 3rd. Lanham: Rowman & Littlefield Publishers, 2020.

Teddy Boyce. *Introduction to Live Sound Reinforcement: The Science, the Art, and the Practice*. 1st. Victoria, BC: Friesen Press, 2014.

James Wasem. *Great Live Sound: A Practical Guide for Every Sound Tech*. 1st. Missoula: Great Sound Institute, 2019.

Raven Biederman. *Basic Live Sound Reinforcement: A Practical Guide for Starting Live Audio*. 1st. Burlington: Focal Press, 2014.

Glen Ballou. *Handbook for Sound Engineers (Audio Engineering Society Presents)*. 5th. Burlington: Focal Press, 2015.

Don Davis, Eugene Patronis, Pat Brown. *Sound System Engineering*. 4th. Burlington: Focal Press, 2013.

Bob McCarthy. *Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment*. 3rd. Burlington: Focal Press, 2016.

Resources Other

1. Student electronics toolkit.

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