MUS-2140: STUDIO MAINTENANCE

Cuyahoga Community College

Viewing: MUS-2140 : Studio Maintenance

Board of Trustees:
September 2023

Academic Term:
Fall 2024

Subject Code
MUS - Music

Course Number:
2140

Title:
Studio Maintenance

Catalog Description:
Reviews basic electronics and sound principles, discusses set-up, calibration and operation of digital and analog recording and test equipment. Topics include
studio layout, technical signal routing, equipment interface, grounding,
maintenance and troubleshooting.

Credit Hour(s):
2

Lab Hour(s):
4

Requisites

Prerequisite and Corequisite
RAT-1500 Recording Theory I, RAT-1511 Recording Lab I, and EET-1130 Basic Audio Electronics, or departmental approval.

Outcomes

Course Outcome(s):
Explain basic electronic theory.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Compare alternating current and direct current.
2. Identify the parts of Ohms Law: voltage, current, resistance.
3. Analyze Ohm's law questions.
4. Demonstrate mathematical problem calculation.
5. Identify the components of a standard North American outlet.
6. Measure voltage from a North American outlet with a multimeter.
7. Compare voltages from two North American outlets to determine service leg.
8. Compare balanced power and balanced audio signal.
9. Identify common electronic components and their block symbols.
10. Categorize electronic components into passive or active.
11. Calculate resistance based on resistor color code bands.

Course Outcome(s):

Demonstrate test equipment operation.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Identify common test equipment.
2. Distinguish proper test equipment and settings of the equipment for specific situations.
3. Prepare test equipment for operation.
4. Build, test, and measure simple audio circuits.
5. Analyze and report findings of simple audio circuits.

Course Outcome(s):

Demonstrate audio equipment interfacing.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Identify common audio connectors.
2. Identify components of audio cabling.
3. Compare balanced and unbalanced audio signal transmission.
4. Build audio adaptor cables XLR to TRS ¼" and RCA to TS ¼" to facilitate connections between equipment.
5. Illustrate patch bay normalling schemes.

Course Outcome(s):

Demonstrate proficient soldering technique.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Demonstrate cable and wire striping techniques.
2. Demonstrate wire and connector tinning.
3. Demonstrate wire and connector soldering.
4. Build a working XLR microphone cable.
5. Build a working in-line polarity reverse.
6. Build a working in-line attenuator.

Course Outcome(s):

Demonstrate analog tape recorder operation and calibration while comparing to digital recorders.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Identify parts of professional analog tape machine.
2. Identify the layers of analog tape.
3. Display proper analog tape storage.

4. Compare analog tape recorders to digital recorders.
5. Compare input monitoring and track record modes.
6. Explain the differences between the selective synchronization head and reproduce head of analog tape machines.
7. Demonstrate analog tape machine cleaning.
8. Demonstrate analog tape machine demagnetizing.
9. Demonstrate calculation to obtain desired machine operating level.
10. Demonstrate overbiasing technique.
11. Memorize generic calibration steps and frequencies.
12. Execute calibration process for analog tape recorders and digital interfaces.
13. Assess effectiveness of calibration.

Course Outcome(s):

Demonstrate studio maintenance procedures.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Compare routine maintenance to occasional maintenance.
2. Demonstrate surface cleaning techniques on audio equipment.
3. Demonstrate component cleaning and lubricating techniques.
4. Display control exercise techniques.
5. Predict maintenance for equipment usage.
6. Create a maintenance journal.

Course Outcome(s):

Demonstrate studio troubleshooting procedures.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Memorize audio signal flow.
2. Retrieve or “Google” service manuals.
3. Examine block diagrams.

Methods of Evaluation:

1. Written assignments
2. Exams
3. Quizzes
4. Lab practicals
5. Participation and discussion
6. Attendance
7. Other methods deemed appropriate by department

Course Content Outline:

1. Electronics review
    a. Electronics terminology
    b. AC and DC power

   c. Balanced AC power
   d. Ground loop prevention
   e. Single point grounding “Star Grounding Technique”
   f. Test equipment operation
      i. Volt-ohm meter operation
      ii. Audio generator/Oscillator operation
      iii. Oscilloscope operation
2. Studio equipment interfacing
   a. Audio connectors
   b. Soldering principles and technique
   c. Patchbay configurations
   d. Polarity reversing
   e. H-Pad attenuator
3. Analog and digital recorders
   a. Analog tape recorder theory and operation
   b. Analog tape recorder cleaning
   c. Analog tape recorder degaussing
   d. Analog tape recorder record and playback calibration
   e. Past and present usage of analog tape recorders
   f. Digital recorder theory
   g. Digital interface calibration
   h. Synchronization
4. Advanced audio signal flow
   a. Troubleshooting
   b. Routing
5. Routine audio equipment maintenance
   a. Cleaning procedures
   b. Test equipment interfacing
   c. Exercising switches and potentiometers

Resources

Loar, Josh. *The Sound System Design Primer*. 1rst Ed. NY: Routledge, 2019.

Popvich, Igor. *Audio Tests & Measurements: How to Test Electronic Components, Audiophile & Guitar Amplifiers and Loudspeakers Using Modern and Vintage Test Instruments*. 1rst Ed. : Career Professionals, 2019.

Hechtman, John. Benshish, Ken. *Audio Wiring Guide*. 1st Ed. Burlington, MA: Focal Press, 2013.

Galluccio, Greg. *Project Studio Blueprint*. IN: Sams, 1992.

Ballou, Glen Ed. *Handbook for Sound Engineers, The New Audio Cyclopedia*. 5th ed.. Burlington, MA: Focal Press, 2015.

Giddings, Phillip. *Audio System Design and Installation*. IN: Sams, 1990.

Davis, Gary. Jones, Ralph. *Yamaha Sound Reinforcement Handbook*. 2ndEd. WI: Yamaha, 1988.

Resources Other

1. Student electronics tool kit.

Top of page
Key: 3166