

# Course Outline

## Audio Equipment Service and Repair

Course Title

GE 214

Dep't. & Course No.

### I. COURSE DESCRIPTION

This course is designed to provide the students with the knowledge and skills in operating, installing, and servicing various audio equipments, circuits and devices used in sound systems. It includes setup, alignment and adjustment of mechanical and electrical parts, and troubleshooting of various audio equipments.

### II. SEMESTER CREDITS: 3 Credits

III. CONTACT HOURS PER WEEK: 2 3 5  
Lecture Lab Total

### IV. PREREQUISITE: GE 124

### V. STUDENT LEARNING OUTCOMES:

At the end of the semester, the student with a combined accuracy of 65% should be able to:

1. Discuss the different types of power supply used in audio equipment.
2. List possible troubles that may occur in power supply circuit.
3. Explain how audio power amplifier works.
4. Discuss the principles of Stereophonic and Quadra sonic amplifiers.
5. Discuss the truth about the speaker system.
6. Discuss the steps in designing speaker enclosure system.

### VI. COURSE CONTENT

#### A. Power Supply Circuits

1. Conventional power supply
2. Switch mode power supply
3. Split-type power Supply

#### B. Amplifiers

1. Classes of Amplifiers
2. Pre-Amplifiers
3. Coupling Methods
4. Bias Stabilization
5. Differential Amplifiers
6. Darlington Pair Amplifiers
7. Stereophonic and Quadrophonic Amplifiers

#### C. Speaker System

1. Speaker
2. Baffles
3. Frequency Cross-Over Dividing Network
4. Two-Way and Three-Way Speaker System
5. Volume Unit Meters

7. Discuss the reproduction of sound effect in audio system.
8. Discuss the tone control circuits and how it works.
9. Discuss how microphone works.
10. Explain the operation of different types of microphone.
11. Discuss the operation of wireless microphone
12. Explain the Digital Audio Technique and System.
13. Discuss how different digital audio storage and Players works.
14. Discuss the technique in repairing CD player.

#### **D. Audio Frequency Principles**

1. Audio Frequency Spectrum
2. Reverberation Principles
3. Audio Synthesizers

#### **E. Volume and Tone Control Circuits**

1. Principle of Volume Control
2. Installation of Balance Control
3. Passive Tone Control
4. Active Tone Control
5. Loudness Control
6. Equalizer

#### **F. Microphones**

1. Kinds of Microphones
2. Directional Response
3. Frequency Response
4. Sensitivity
5. Microphone Cable Installation
6. Wireless Microphone
7. Testing Procedures

#### **G. Introduction to Digital Audio**

1. Introduction to Audio CD
2. Fundamental block of Audio CD
3. Functions and operation of each block of an Audio CD Player
4. Check and test the optical block and servo mechanism
5. Troubleshoot the Audio CD player

#### **H. MP3 and MP4 Player**

1. Different types of audio and video format.
2. Concept of recoding
3. Fundamental block of the Audio player.
4. Tips in caring the player
5. Tips repairing the player

## **VII. MATERIALS AND EQUIPMENT**

Double Cassette Tape Recorder Player Deck  
CD Player Deck  
Dynamic Microphones  
Stereo Amplifier  
Headphones  
Speaker System  
Audio Mixer  
Audio Synthesizer  
Graphic Equalizer  
Audio Cassettes  
Compact Discs  
RCA Connectors  
Alligator Clip Connectors  
Standard Speaker Wires

## **VII. TEXT AND REFERENCES**

A. Required Text: Instructor's made handouts

## **IX. METHOD OF INSTRUCTION**

- B. Lecture for the presentation of theory
- C. Demonstration for the presentation of skills
- D. Discussion and questioning for test of understanding
- E. Practical Experiments for emphasis of known principles

## **X. METHOD OF EVALUATION**

A. Lecture presentation will be tested using the written test method.  
Laboratory evaluation will be rated based on the following criteria.

- 1. Accuracy
- 2. Appearance
- 3. Completion
- 4. Techniques

B. The components with corresponding weight in percent included in the Computation of Midterm and Final grades are:

Participation .....	10%
Portfolio .....	10%
Quizzes/Homework .....	10%
Midterm/Final Examination .....	20%
Laboratory Performance/Project.....	<u>50%</u>
<b>TOTAL = 100%</b>	

The transmutation of total percent to letter grade is as follows:

90% - 100% .....	A
80% - 89% .....	B
70% - 79% .....	C
65% - 69% .....	D
0 - 64% .....	F

### TASK LISTING SHEET

#### AUDIO EQUIPMENT SERVICING

Course Title

GE 214

Dep't. & Course No.

Credits: 2 1 48  
Lec Lab Total Lab Hrs

<i>Laboratory Objectives</i>	<i>Time Allotment</i>
<b>A. Assemble Audio Power Amplifier Circuit</b>	15
1. Build a split type power supply	
2. Build a power amplifier equipment	
3. Build a Tone control circuit	
<b>B. Connect Speaker System</b>	9
1. Investigate the operation of speaker and crossover network	
2. Wire speaker systems and other accessories	
<b>C. Setup Audio Equipment</b>	6
1. Install audio equipment in the panel board	
2. Hook up the all the installed audio equipment and operate	
<b>D. Troubleshoot and Repair Audio Equipment.</b>	18
1. Fix problems in microphones	
2. Fix problem in Audio Amplifiers	
3. Fix problems in Audio Cassette/CD player	
4. Fix problems in Speaker system	

**Palau Community College**  
**GE 214 – AUDIO EQUIPMENT SERVICE AND REPAIR**  
**Course Learning Outcomes**

During the course experience, the course learning outcomes (CLO) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical rating of 4,3,2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcome listed below.

- Rating Scale: 5 Excellent  
 4 Above-Average  
 3 Average  
 2 Below Average  
 1. Unacceptable

**CLO 1: Assemble audio power amplifier circuit.**

5	Design the printed circuit board of the power amplifier circuit, mount all the electronic components of the circuit, test the operation of the circuit, and assemble the amplifier circuit in the chassis with 90% - 100% accuracy.
4	Design the printed circuit board of the power amplifier circuit, mount all the electronic components of the circuit, test the operation of the circuit, and assemble the amplifier circuit in the chassis with 80% - 89% accuracy.
3	Design the printed circuit board of the power amplifier circuit, mount all the electronic components of the circuit, test the operation of the circuit, and assemble the amplifier circuit in the chassis with 70% - 79% accuracy.
2	Design the printed circuit board of the amplifier circuit, mount all the electronic components of the circuit, test the operation of the circuit, and assemble the amplifier circuit in the chassis with 65% - 69% accuracy.
1	Design the printed circuit board of the power amplifier circuit, mount all the electronic components of the circuit, test the operation of the circuit, and assemble the amplifier circuit in the chassis with below 65% accuracy.

**CLO 2: Connect speaker system.**

5	Match the output of power amplifier to the input speaker system, determine the type of crossover network to be used in speaker system, prepare the baffle for speaker installations, and mount and wire all the speakers with 90% - 100% accuracy.
4	Match the output of power amplifier to the input speaker system, determine the type of crossover network to be used in speaker system, prepare the baffle for speaker installations, and mount and wire all the speakers with 80% - 89% accuracy.
3	Match the output of power amplifier to the input speaker system, determine the type of crossover network to be used in speaker system, prepare the baffle for speaker installations, and mount and wire all the speakers with 70% - 79% accuracy.
2	Match the output of power amplifier to the input speaker system, determine the type of crossover network to be used in speaker system, prepare the baffle for speaker installations, and mount and wire all the speakers with 65% - 69% accuracy.
1	Match the output of power amplifier to the input speaker system, determine the type of crossover network to be used in speaker system, prepare the baffle for speaker installations, and mount and wire all the speakers with below 65% accuracy.

**CLO 3: Set up audio equipment.**

5	Test the operation of all audio equipment, hookup all the audio equipment to one another, test the operation of all input and output devices, and adjust performance of the audio equipment to a quality sound with 90% - 100% accuracy.
4	Test the operation all audio equipment, hookup all the audio equipment to one another, test the operation of all input and output devices, and adjust performance of the audio equipment to a quality sound with 80% - 89% accuracy.
3	Test the operation all audio equipment, hookup all the audio equipment to one another, test the operation of all input and output devices, and adjust performance of the audio equipment to a quality sound with 70% - 79% accuracy.
2	Test the operation all audio equipment, hookup all the audio equipment to one another, test the operation of all input and output devices, and adjust performance of the audio equipment to a quality sound with 65% - 69% accuracy.
1	Test the operation all audio equipment, hookup all the audio equipment to one another, test the operation of all input and output devices, and adjust performance of the audio equipment to a quality sound with below 65% accuracy.

**CLO 4: Troubleshoot and repair audio equipment.**

5	Locate the source of problem, identify the defective parts, and safely fix the problem with no instruction or assistance from the supervisor.
4	Locate the source of problem, identify the defective parts, and safely fix the problem with no instruction but limited supervision.
3	Locate the source of problem, identify the defective parts, and safely fix the problem with some instruction and more than limited supervision.
2	Locate the source of problem, identify the defective parts, and safely fix the problem with considerable instruction and close supervision.
1	Unable to locate and fix the problem even with close instruction and supervision. Little to no experience and knowledge in the area.