

Course Outline

VIDEO SYSTEMS REPAIR AND MAINTENANCE

Course Title

GE 222

Dep't. & Course No.

I. COURSE DESCRIPTION

This course is designed to provide students with knowledge and skills required in dealing with other video equipment, such as: video cassette recorder/player, 8mm cam coder, DVD video disk recorder/player and installing security camera system in commercial or residential area. It covers the analysis of functional blocks, hook-up, electrical and mechanical alignments, disassembly and assembly procedures, replacements of parts and troubleshooting techniques.

SEMESTER CREDITS: 3

II. **CONTACT HOURS PER WEEK:** $\frac{2}{\text{(Lecture)}}$ $\frac{3}{\text{(Lab.)}}$ $\frac{5}{\text{(Total)}}$

III. **PREREQUISITE:** GE 214 & GE 215

IV. **STUDENT LEARNING OUTCOMES:**

V. **COURSE CONTENT**

At the end of the semester, the students should be able, with 65% accuracy, to:

1. Discuss the basic operation of VCR and hook-up system.
2. Explain the basic maintenance procedure of VCR system.
3. Discuss the tape path alignment procedure for VCR.
4. List the most common troubles of VCR and discuss how to deal with it.
5. Discuss the technique in troubleshooting the loader and transport mechanism.

A. **VCR Operations and Controls**

1. Operating Controls
2. Hookups and Connections

B. **VCR Disassembly Procedures**

1. Safety Techniques
2. ESD Precautions
3. Cover Shield Plates
4. Circuit Boards

C. **Tape Path Alignment**

1. Tape Tension
2. Supply-side Guide Pole
3. Roller Guide Post
4. V-Mounts
5. A/C Heads
6. Take up-side Guide Pole
7. Pinch Roller
8. Supply and Take Up Spindle Brakes
9. Mode Switches

D. **Troubleshooting Loader and Transport Malfunction**

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6. Discuss the basic operation of Camcoder.
7. Explain the basic maintenance procedure of Camcoder system.
8. List the most common troubles of Camcoder and discuss how to deal with it.
9. Discuss the basic operation of DVD player.
10. List the different parts of DVD player and explain the function of each parts
11. Discuss the steps in replacing the optical lens and motors.

1. Systematic Approach to Diagnosing Problems
2. Cassette Load and Unload Problems
3. Tape Load and Unload
4. Tape Motion

E. The CAMCORDER

1. CCD Operation
2. Image Processing
3. Mechanical Control
4. Mode Control
5. Camera Control

F. The VTR Section

1. Review of the Cassette and Tape Transport Mechanism
2. The Drum Servo
3. The Capstan Servo
4. The ATF Servo
5. The Power Distribution Block

G. CAMCORDER Video Audio System

1. Conventional Audio Recording System
2. FM Audio, PCM and Fixed Head Audio
3. AFM System

H. CCD Video Camera Troubleshooting

1. Conventional Audio Recording System
2. FM Audio, PCM and Fixed Head Audio
3. AFM System

I. DVD Operation

1. Introduction
2. Data Format
3. Block Diagram
4. Section Operation
 - a. Servo mechanism
 - b. Optical block
 - c. Video Circuit
 - d. Audio circuit

J. Motors, Optical Sensors and Remotes

1. Two Terminal DC Motor
2. Optical Sensor

12. List the common troubles of DVD player and how to Deal with it.

13. Discuss the different digital audio recording format.

14. Discuss the fundamental concept of CCTV.

15. Discuss the requirements in installing CCTV.

16. Discuss the steps in fixing problems in CCTV.

3. Remote Control System

K. DVD Optical Pick-up Block

1. Focusing Procedure
2. Disc Detection Process
3. Signal Pick-up and Processing
4. User Controls

L. Optical Device Removal and Replacement

1. Precautions
2. Removal and Replacement Techniques

M. DVD Audio Signals

1. Analog Audio Signal
2. Digital Audio Signal
3. Control Signal

N. CCTV System

1. Elements
2. Operating Equipment
3. Cable wires, impedance, and losses
4. Distortions

O. Installation

1. Method of installation
2. Using wireless connection
3. Distribution system

P. Troubleshooting

1. Safety procedure
2. Tips and Techniques
3. Tester

VII. EQUIPMENT AND MATERIALS

- A. VCR/DVD Player and recorder
- B. Camcorder
- C. Set of Hand tools and Instruments
- D. Security camera equipment
- E. Video Monitor
- F. Cable and connector
- G. Coupler

VIII. TEXT AND REFERENCES

- A. Text: None. Instructor's made handouts

IX. METHODS OF INSTRUCTION

The following methods of instruction will be used.

1. Lecture for the presentation of theory.
2. Demonstration for the presentation of skills.
3. Discussion and questioning for test of understanding.
4. Laboratory experiments for emphasis of known principles.
5. Project Construction.

X. METHOD OF EVALUATION

A. Lecture presentation will be tested using the written test

Laboratory evaluation will be rated based on the following four criteria:

- a. Accuracy
- b. Appearance
- c. Completion
- d. 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>
TOTAL = 100%	

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

VIDEO SYSTEMS REPAIR and MAINTENANCE

Course Title

GE 222

Dep't. & Course No.

Credits: 2 1 48
 Lec Lab Total Lab Hrs

<i>Laboratory Objectives</i>	<i>Time Allotment</i>
1. Troubleshoot and repair VCR	12
1. Perform basic maintenance of VCR 2. Assemble and disassemble the mechanical section of VCR 3. Adjust and align mechanical trouble of VCR 4. Perform VCR troubleshooting	
2. Troubleshoot and repair camcorder	12
1. Perform basic maintenance of camcorder 2. Assemble and disassemble the mechanical section of camcorder 3. Adjust and align mechanical trouble of camcorder 4. Perform camcorder troubleshooting	
3. Troubleshoot and repair DVD player	12
1. Test and replace defective motors of the DVD player 2. Test and replace defective optical lens of the DVD player 3. Troubleshoot and repair power circuit problem 4. Test and replace defective system control or Video board	
4. Install security camera system	12
1. Create plan for installation 2. Calculate the required length of cable 3. Mounting and installing all the elements 4. Test the operation of the security camera system	

Palau Community College
GE-222-VIDEO SYSTEM REPAIR AND MAINTENANCE
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	2 Below Average
4 Above-Average	1 Unacceptable
3 Average	

CLO 1: Troubleshoot and Repair VCR.

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

CLO 2: Troubleshoot and Repair Camcorder.

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

CLO 3: Troubleshoot and Repair DVD player.

5	Locate the source of problem of DVD, identify the defective parts, and safely fix the problem with no instruction or assistance from the supervisor.
4	Locate the source of problem of DVD, identify the defective parts, and safely fix the problem with no instruction but limited supervision.
3	Locate the source of problem of DVD, identify the defective parts, and safely fix the problem operation with some instruction and more than limited supervision.
2	Locate the source of problem of DVD, identify the defective parts, and safely fix the problem with considerable instruction and close supervision.

1	Unable to troubleshoot and repair DVD player even with close instruction and supervision. Little to no experience and knowledge in the area.
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CLO 4: Install security camera system

5	Identify the different elements of security camera system, wire the system according to the wiring diagram, test and operate system with 90%-100% accuracy
4	Identify the different elements of security camera system, wire the system according to the wiring diagram, test and operate system with 80%-89% accuracy
3	Identify the different elements of security camera system, wire the system according to the wiring diagram, test and operate system with 70%-79% accuracy
2	Identify the different elements of security camera system, wire the system according to the wiring diagram, test and operate system with 65%-69% accuracy
1	Identify the different elements of security camera system, wire the system according to the wiring diagram, test and operate system with 65% accuracy.