

Course Outline

PRINCIPLES OF ELECTRONIC COMMUNICATION SYSTEMS

GE 126
Dep't. & Course No.

I. COURSE DESCRIPTION

This course is designed to provide the students a comprehensive understanding on the principles of electronic communication systems. It covers principles of radio communication, troubleshooting of AM/FM radio receivers, radio transmitter circuit and some experiments in telephone system and local-area networking.

II. SEMESTER CREDITS: 3

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

IV. PREREQUISITE: GE114, GE115, & ET103

V. STUDENT LEARNING OUTCOMES:

At the end of the semester the student with a combination of accuracy of 65% will be able to

1. Discuss safety principles in handling electronics communication equipment.
2. Identify the elements of electronics communication system
3. Explain the importance of modulation in electronics communication system.
4. Discuss the requirements for AM signal transmission.
5. Explain the operation AM radio receiver

VI. COURSE CONTENT

A. Safety Principles

1. Laboratory Safety
2. Test Equipment Safety Precaution

B. Elements of Communication System

1. The Source Signal
2. The channel
3. Types of Receiver

C. Types of Modulation

1. Amplitude modulation
2. Frequency Modulation
3. Phase Modulation

D. AM Transmitter Stages and Signals

1. Am transmitter requirements
2. Typical AM transmitter topologies
3. Transmitter stages
4. Measurement and troubleshooting

E. Typical AM Radio Receiver

stages and signals.

6. Explain the operation FM radio transmitter stages and signals

7. Explain the operation FM radio receiver stages and signals.

8. Discuss the principles FM Stereo operation.

9. Discuss the structure and operation of telephone system.

10. List the different topologies of Local Area Networking and explain how it works.

Stages and Signals

1. Demodulation
2. Receiver Characteristics
3. Transceivers
4. AM Radio Receiver Test Procedures
5. Troubleshoot AM Radio Receivers

F. Typical FM Transmitter Stages and Signals

1. FM Transmitter Stages
2. FM Transmitter Circuit
3. FM Transceivers
4. FM Stereo Transmitter

G. Typical FM Receiver Stages and Signals

1. FM stages and operations
2. FM Radio Receiver Schematic and Circuit Construction

H. Principles of FM Stereo

1. Multiplexing
2. FM Stereo System
3. Balanced Modulation
4. Frequency Doublers
5. Composite FM Stereo Signal
6. Matrix Decoder Principle

Telephone System

1. Structure of s switch network
2. Setting up a call
3. Signals and noise in the telephone system
4. In-channel and common-channel signaling
5. Frequency division multiplexing

J. Local-Area Networks

1. Local-Area network topologies
2. Software

VII. EQUIPMENT AND MATERIALS

- A. RF Signal Generator
- B. Telecommunication trainer
- C. VOM

- D. DMM with Capacitance Meter
- E. Cathode Ray Oscilloscope 100 Mhz
- F. Regulated Power Supply
- G. Precision Screw Driver Set
- H. Headphones
- I. Precision Alignment Tool Set
- J. Universal Crimping Tools
- K. Over Head Projector
- L. Soldering Iron
- M. RCA Connectors
- N. Alligator Clip Connectors
- O. AM Radio Receiver Kits
- P. FM Radio Receiver Kits
- Q. TV modulator transmitter Kits
- R. Computer
- S. Assorted Components (resistors, capacitors, diodes, transistors, ICs)
- T. AWG #22 Solid Wire Connectors
- U. Telephone Modular Plugs and Jacks
- V. Telephone wires

VIII. TEXT AND REFERENCES

- A. Required Text: 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 grade are:

Participation	10%
Portfolio	10%
Quizzes/Homework	10%
Midterm/Final Examination	20%
Laboratory Performance/Project.....	50%
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

Form NC-2
TASK LISTING SHEET

PRINCIPLES OF ELECTRONIC COMMUNICATION SYSTEMS

GE 126

Dep't. & Course No.

Course Title

Credits: 2 1 48
 Lec Lab Total Lab Hrs

<i>Laboratory Objectives</i>	<i>Time Allotment</i>
1. Assemble the AM/FM radio transmitter circuit	9
Prepare the parts for assembly Mounting and Soldering of the parts Test and tune-up the transmitter radio	
2. Troubleshoot and repair the AM/FM radio transmitter circuit.	9
Locate and repair the defective parts on modulator stage Locate and repair the defective parts on amplifier stage	
3. Assemble the AM/FM radio receiver circuit	9
Prepare the parts for assembly Mounting and Soldering of the parts Test and tune-up the radio receiver	
4. Troubleshoot and repair the AM/FM radio receiver circuit	15
Locate and repair the defective parts on tuning section Locate and repair the defective parts on IF amp section Locate and repair the defective parts on Audio section	
5. Splice and connect telephone and LAN cable	6
Prepare tools and Material Splice cable for straight connectors and test it Splice cable for cross connectors and test it Splice cable for telephone connectors and test it.	

Palau Community College
GE 126- PRICIPLES OF ELECTRONICS COMMUNICATION SYSTEMS
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 the AM/FM radio transmitter circuit.

5	Demonstrate knowledge and skills in assembling the AM/FM radio transmitter circuit with no instruction or supervision.
4	Demonstrate knowledge and skills in assembling the AM/FM radio transmitter circuit with no instruction but limited supervision.
3	Demonstrate knowledge and skills in assembling the AM/FM radio transmitter circuit with some instruction and more than limited supervision.
2	Demonstrate knowledge and skills in assembling the AM/FM radio transmitter circuit with considerable instruction and close supervision.
1	Unable to assembling the AM/FM radio transmitter circuit even with close instruction and supervision. Little to no experience and knowledge in the area.

CLO 2: Troubleshoot and repair the AM/FM radio transmitter circuit.

5	Diagnose and fix the problem of the AM/FM radio transmitter circuit with no instruction or supervision.
4	Diagnose and fix the problem of the AM/FM radio transmitter circuit with no instruction but limited supervision.
3	Diagnose and fix the problem of the AM/FM radio transmitter circuit with some instruction and more than limited supervision.
2	Diagnose and fix the problem of the AM/FM radio transmitter circuit with considerable instruction and close supervision.
1	Unable to diagnose and fix the problem of the AM/FM radio transmitter circuit even with close instruction and supervision. Little to no experience and knowledge in the area.

CLO 3: Assemble the AM/FM radio receiver circuit.

5	Demonstrate knowledge and skills in assembling the AM/FM radio receiver circuit with no instruction or supervision.
4	Demonstrate knowledge and skills in assembling the AM/FM radio receiver circuit with no instruction but limited supervision.

3	Demonstrate knowledge and skills in assembling the AM/FM radio receiver circuit with some instruction and more than limited supervision.
2	Demonstrate knowledge and skills in assembling the AM/FM radio receiver circuit with considerable instruction and close supervision.
1	Unable to assemble AM/FM radio receiver circuit even with close instruction and supervision. Little to no experience and knowledge in the area.

CLO 4: Troubleshoot and repair the AM/FM radio receiver circuit.

5	Diagnose and fix the problem of the AM/FM radio receiver circuit with no instruction or supervision.
4	Diagnose and fix the problem of the AM/FM radio receiver circuit with no instruction but limited supervision.
3	Diagnose and fix the problem of the AM/FM radio receiver circuit with some instruction and more than limited supervision.
2	Diagnose and fix the problem of the AM/FM radio receiver circuit with considerable instruction and close supervision.
1	Unable to fix the problem of the AM/FM radio receiver circuit even with close instruction and supervision. Little to no experience and knowledge in the area.

CLO 5: Splice and connect telephone and LAN cable to the system.

5	Demonstrate knowledge and skills in splicing and connecting telephone/LAN cable to the system with no instruction or supervision.
4	Demonstrate knowledge and skills in splicing and connecting telephone/LAN cable to the system with no instruction but limited supervision.
3	Demonstrate knowledge and skills in splicing and connecting telephone/LAN cable to the system with some instruction and more than limited supervision.
2	Demonstrate knowledge and skills in splicing and connecting telephone/LAN cable to the system with considerable instruction and close supervision.
1	Unable to splice and connect telephone/LAN cable to the system even with close instruction and supervision. Little to no experience and knowledge in the area.