

**College of Micronesia – FSM**  
**P.O. Box 159**  
**Kolonia, Pohnpei**

**Course Outline Cover Page**

**Telephone Systems**  
Course Title

**VTE 280**  
Department and Number

**Course Description:** This course is designed to introduce students to basic telephone systems and the operation of telephone equipment. It will further focus its study on cellular telephone systems. Students will be introduced to the basic elements, circuits, and techniques of cellular telephone communication systems.

**Prepared by:** Gardner Edgar

**State:** Pohnpei

	Hours per week	No. of weeks	Total Hours	Semester Credit
Lecture	3	16	48	3
Laboratory				

**Total credits: 3**

<b>Purpose of Course</b>	Degree Requirement	_____XX_____
	Degree Elective	_____
	Advanced Certificate	_____
	Certificate	_____
	Remedial	_____
	Other (Workshop)	_____

**Prerequisite Course(s):** VEE 240 Signal Processing

\_\_\_\_\_  
**Signature, Chairman, Curriculum Committee**

\_\_\_\_\_  
**Date Approved by Committee**

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**Signature, President, COM-FSM**

\_\_\_\_\_  
**Date Approved by the President**

**General Objectives:** Students will demonstrate an understanding of the basic operation of a telephone system. In addition, students will correctly perform troubleshooting skills on two common types of telephone sets, and demonstrate the use of fiber optics and microwaves used in a telephone system. Also, students will study the operation and use of the cellular telephone from a theoretical and hardware perspective.

**Learning Outcomes:** Upon successful completion of this course student will be able to:

1. Describe the major sections of the basic elements in a telephone system.
2. Describe the telephone system used in the U.S. and the F.S.M.
3. Describe and troubleshoot the operations of the mechanical and electronic telephone sets.
4. Describe and demonstrate two methods of signal processing and two types of connection links that are commonly used today's telecommunications, or telephone systems.
5. Describe cellular telephone from a theoretical and hardware perspective.

**Outline of Content** The course content is as follows:

1. Introduction to Communications Systems
  - a. Basic elements in a communication system
  - b. Major sections of the basic element of a communication system
  - c. Two fundamental limiting factors in a communication system
2. Telephone Systems
  - a. Local network telephone system
  - b. Local call operation
  - c. Long distant calling operation
3. Telephone Equipment
  - a. Operation of the mechanical telephone set
  - b. Operation of the electronic telephone set
4. Advanced Telephone
  - a. Time Division Multiplexing
  - b. Pulse Code Modulation
  - c. Fiber optics transmission mediums
  - d. Microwave transmission mediums (wireless)
5. Cellular Telephone
  - a. Cellular telephone
  - b. Original mobile telephone versus cellular telephone
  - c. Theoretical and physical structures of cellular telephones
  - d. Process of cellular telephones
  - e. Cell splitting, frequency reuse, hand-off, and roaming

f. Modulation and multiplexing used in cellular telephones

<b>Learning Outcomes</b>	On completion of this course student will be able to:
<b>Learning Outcome 1:</b>	<b>Describe the major sections of the basic elements in a telephone system.</b>
Assessment criteria	a. Define the basic elements that compose a communication system. b. Define major sections of the basic elements of a communication system. c. State the two fundamental limiting factors in a communication system.
Assessment methods	Multiple choice questions Short answer questions
<b>Learning Outcome 2:</b>	<b>Describe the telephone system used in the U.S. and the F.S.M.</b>
Assessment criteria	a. Describe the local network telephone system b. Describe how a local telephone call is accomplished. c. Describe the operation of a local loop. d. Describe long distant calling in a telephone system.
Assessment methods	Multiple choice questions Short answer questions
<b>Learning Outcome 3:</b>	<b>Describe and troubleshoot the operations of the mechanical and electronic telephone sets.</b>
Assessment criteria	a. Describe and verify the normal operation of the mechanical telephone set. b. Describe and verify the normal operation of the electronic telephone set. c. Troubleshoot signal path from a telset through interface circuits to another telset.
Assessment condition	Multiple choice questions Short answer questions Practical exercises/tests

**Learning Outcome 4:**      **Describe and demonstrate two methods of signal processing and two types of connection links that are commonly used today's telecommunications, or telephone systems.**

Assessment criteria      a. Describe time division multiplexing and how it is used in telecommunication systems.  
b. Describe pulse code modulation and how it is used in telecommunication systems.  
c. Describe fiber optics and microwave transmission mediums and how they are used in telecommunication systems.  
d. Observe the operation of time division multiplexing, pulse code modulation, fiber optics, and microwaves in a telecommunication system.

Assessment methods      Multiple choice questions  
Short answer questions  
Practical exercises/tests

**Learning Outcome 5:**      **Describe cellular telephone from a theoretical and hardware perspective.**

Assessment criteria      a. Define cellular telephony  
b. Explain the difference between the original mobile telephones and cellular telephones.  
c. Describe the theoretical and physical structures of a cellular telephone system.  
d. Describe the process of cellular telephone call  
e. Explain cell splitting, frequency reuse, hand-off, and roaming.  
f. Examine the modulation and multiplexing techniques used in cellular telephones.

Assessment methods      Multiple choice questions  
Short answer questions

**Required Course Materials:**

**1. Instructor:**

- a. CAI Classroom with whiteboard or chalkboard
- b. Laboratory equipment with tools of the trade

- c. Text, Teacher's Resource Guide, workbook
- d. Overhead projector, transparencies

**2. Student:**

- a. Text(s), handouts provided by instructor
- b. Ring binder
- c. College ruled note sheet, pencil or pen
- d. Scientific calculator

**Reference Materials:**

Electronic Devices, *Fourth Edition*  
Thomas L. Floyd,

Modern Electronic Communication, *Seventh Edition*  
Gary M. Miller, Jeffrey S. Beasley

**Method of Instruction:**

- 1. Lecture and Discussion
- 2. Computer Aided Instruction
- 3. Practical/Experimentation

**Evaluation:**

Final Grade for this course will be based on meeting the course requirements at the following percentage rates:

90% - 100%	A – Superior
80% - 89%	B – Above Average
70% - 79%	C – Average
60% - 69%	D – Below Average
0 % - 59%	F – Failure

**Attendance:**

The COM-FSM attendance policy will apply