College of Micronesia – FSM

P.O. Box 159
Kolonia, Pohnpei

Course Outline Cover Page

Telecommunication Systems — Course Title

VTE 270 — Department and Number

Course Description: This course is designed to provide students a broader view to the field of telecommunications. Common terminologies, transmission and reception processes, limiting factors, and other fundamentals are presented. Study also included Connection Links, Network Switching, Broadcast Systems, Global Positioning Systems (GPS), Spread Spectrum Modulation, Information Systems, and Satellite 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

Purpose of Course

Degree Requirement	XX
Degree Elective	
Advanced Certificate	
Certificate	
Remedial	
Other (Workshop)	

Prerequisite Course(s): VEE 240 Signal Processing

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Signature, Chairman, Curriculum Committee — **Date Approved by Committee**

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Signature, President, COM-FSM — **Date Approved by the President**

General Objective: Students will be familiarized with the various types of telecommunication systems used in the industry. These include the basic elements in a telecom system, transmission medium types, common switching operations, types of broadcast systems, spread spectrum modulation, computer network (wired and wireless), and the operating principles of satellite systems.

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

1. Describe the basic fundamentals of a telecom system.
2. Describe the various types of connection links used by industry for telecommunication system worldwide.
3. Describe the common switching operations found in the telecommunications industry.
4. Describe the different types of broadcast systems commonly used by industry and government.
5. Define spread spectrum modulation and describe its general purpose and its applications.
6. Describe the basic operating principles of wired and wireless computer network.
7. Describe the operating principles of satellite systems and its advantages and limitations.

Outline of Content The course content is as follows:

1. Introduction to Telecommunications
    a. Common telecommunications terminology
    b. Operations of the basic elements in telecom systems
    c. Limiting factors in telecom systems

2. Connection Links
    a. Two main categories of connection links: Physical and Atmospheric
    b. Different types of links: cable, fiber optics, radio, microwave, and satellite

3. Introduction to Network Switching
    a. Switching and Exchange
    b. Four major methods of switching: Circuit Switching, Message Switching, Packet Switching, and Combined Switching
    c. Asynchronous Transfer Mode (ATM) Switching

4. Broadcast Systems
    a. Purpose and role of broadcast systems
    b. Different types of broadcast systems: Television and Radio
    c. Global Positioning System (G.P.S)

5. Spread Spectrum Modulation
    a. Purpose of spread spectrum modulation and its benefits

b. Different techniques of spread spectrum modulation
c. Pseudo-Random (PN) sequence generation in spread spectrum systems
d. Process of synchronization and preamble in spread spectrum systems

6. Information Systems
    a. Definition of "network"
    b. Local Area Network (LAN), Wide Area Network (WAN), Metropolitan Area Network (MAN).
    c. Network topologies and components
    d. Benefits of wireless network
    e. Radio frequency (RF) and Infrared region (IR) wireless networks

7. Satellite Systems
    a. Satellite types and capabilities
    b. Advantages and limitations of satellite radio
    c. Multi access techniques and common satellite electronic circuits

Learning Outcomes: On completion of this course the student will be able to:

Learning Outcome 1: **Describe the basic fundamentals of a telecom system.**

Assessment Criteria
a. Use common telecommunication terminology
b. Describe the basic elements that make up a telecommunications system
c. Describe how the basic elements work together to achieve telecommunication.
d. Discuss the two fundamentals limiting factors in a telecommunications system.

Assessment Methods
Multiple choice questions
Short answer questions

Learning Outcome 2: **Describe the various types of connection links used by industry for telecommunication system worldwide.**

Assessment Criteria
a. Define a connection link
b. Identify the two major categories of connection links.
c. Describe the types of links used in telecommunications industry.

Assessment Methods
Multiple choice questions
Short Answer Questions

Learning Outcome 3: **Describe the common switching operations found in the telecommunications industry.**

Assessment Criteria	a. Define switching in telecommunications. b. Describe the purpose of switching in a telecommunications network. c. Identify and describe the four major methods of switching.
Assessment Methods	Multiple choice questions Short Answer Questions

Learning Outcome 4:	**Describe the different types of broadcast systems commonly used by industry and government.**
Assessment Criteria	a. Define a broadcast system. b. Explain the role of broadcast systems in telecommunications. c. Identify and discuss the different types of broadcast systems. d. Describe the purpose and use of the Global Positioning System.
Assessment Methods	Multiple choice questions Short answer questions

Learning Outcome 5:	**Define spread spectrum modulation and describe its general purpose and its applications.**
Assessment Criteria	a. Define and explain the purpose of spread spectrum modulation. b. Identify the benefits and the different techniques of spread spectrum modulation. c. Describe PN sequence generation. d. Describe the need and process for synchronization and preamble in spread spectrum systems
Assessment Methods	Multiple choice questions Short answer questions

Learning Outcome 6:	**Describe the basic operating principles of wired and wireless computer network.**
Assessment Criteria	a. Define the term “network” b. Describe LANs, WANs, and MANs in their common configurations. c. Identify common components and topologies of networks. d. Explain the benefits of wireless networks. e. Discuss RF and IR wireless network. f. Describe the use of spread spectrum in wireless networks.

Assessment Methods	Multiple choice questions Short answer questions
Learning Outcome 7:	**Describe the operating principles of satellite systems and its advantages and limitations.**
Assessment Criteria	a. Describe satellite telecommunications systems including satellite types and capabilities. b. Discuss advantages and disadvantages of satellite radio. c. List multiple access techniques and common satellite electronic circuits.
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