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COURSE INFORMATION

Alternate Title: Comm Elec & Trans Systems

Description:

10-451-208 COMMUNICATIONS ELECTRONICS AND TRANSMISSION SYSTEMS ...introduces the fundamentals of electronic communication systems. Topics include the frequency spectrum, electrical noise, modulation techniques, characteristics of transmitters and receivers, and digital communications. Upon completion, students should be able to interpret analog and digital communication circuit diagrams, analyze transmitter and receiver circuits, and use appropriate communication test equipment.

Instructional Level: 10

Total Credits: 2

Total Hours: 54

COURSE HISTORY

Status: Active

Active Date: 5/23/2021

Last Revision Date: 10/24/2023

Revised By: Kristina Wendricks (15002977)

Last Approval Date: 10/24/2023

Approved By: Kristina Wendricks (15002977)

COURSE COMPETENCIES

1. Analyze the functions of transmitters and receivers.

Status: Active

Criteria

Learners will be successful when they are able to:

- 1.1. Identify transmitters and receivers
- 1.2. Describe the concept of frequency
- 1.3. Describe the concept of bandwidth
- 1.4. Describe the concept of power and sensitivity
- 1.5. Discuss how transmitters and receivers work together to communicate information over a distance.

Learning Objectives

- 1.a. Describe the different types of transmitters and receivers.
- 1.b. Explain the key characteristics of transmitters and receivers.
- 1.c. Explain how transmitters and receivers work together to communicate information over a distance.

2. Explain the factors that affect the performance of transmitters and receivers.

Status: Active

Criteria

Learners will be successful when they are able to:

- 2.1. Explain the influence of environmental factors, such as temperature, humidity, and atmospheric conditions, on the performance of transmitters and receivers in various communication systems.
- 2.2. Propose effective mitigation strategies to enhance overall performance.
- 2.3. Discuss recent technological advancements in transmitter and receiver design

Learning Objectives

- 2.a. Identify factors that affect the performance of transmitters and receivers.
- 2.b. Evaluate the Impact of Environmental Variables on Transmitter and Receiver
- 2.c. Analyze Signal Interference and Mitigation Strategies.

3. Characterize various types of transmitters and receivers.

Status: Active

Criteria

Learners will be successful when they are able to:

- 3.1. Discuss radiation patterns (omni-directional and directional)
- 3.2. Identify components of polar charts
- 3.3. Read H-plane and E-plane views
- 3.4. Discuss VSWR
- 3.5. Describe the effects of mounting on signal loss
- 3.6. Interpret ingress protection (IP) classifications

Learning Objectives

- 3.a. Discuss antenna propagation properties specific to a type.
- 3.b. Read polar charts.
- 3.c. Discuss proper antenna installation and setup

4. Improve professional communication skills

Status: Active

Criteria

Learners will be successful when they are able to:

- 4.1. Discuss strategies for communicating technical concepts to non-technical audiences
- 4.2. Complete a mock interview
- 4.3. Prepare telecom interview questions

Learning Objectives

- 4.a. Demonstrate effective verbal and nonverbal communication skills in mock interviews and roleplay exercises
- 4.b. Prepare elevator pitches highlighting telecom experience and qualifications
- 4.c. Research trends in telecom job interviews and employer priorities
- 4.d. Critique sample telecom interview questions and prepare sample responses

5. Discuss principles of cellular data transmission

Status: Active

Criteria

Learners will be successful when they are able to:

- 5.1. Explain the cellular network architecture and role of key components
- 5.2. Compare different generations of cellular network technologies
- 5.3. Describe the end-to-end process of initiating a call or data transfer on a cellular network

Learning Objectives

- 5.a. Examine protocols and techniques used for mobility management as users move between cells
- 5.b. Analyze factors that impact signal quality and data transmission rates
- 5.c. Use network simulation tools to model a basic cellular network topology
- 5.d. Evaluate strategies for maximizing network capacity and coverage area