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COURSE INFORMATION

Alternate Title: Intro to Wireless Technologies

Description:

10-451-103 INTRODUCTION TO WIRELESS TECHNOLOGIES ...introduces the fundamental elements of wireless technology relevant to tower installation including wireless networks and applications services as well as a basic technical overview of spectrum principals and characteristics. (Pre-Requisite: 10-451-110 Utility Safety)

Instructional Level: 10

Total Credits: 2

Total Hours: 54

COURSE HISTORY

Status: Active

Active Date: 5/23/2021

Last Revision Date: 2/14/2022

Revised By: Kristina Wendricks (15002977)

Last Approval Date: 2/14/2022

Approved By: Kristina Wendricks (15002977)

COURSE COMPETENCIES

1. Discuss the evolution of telecommunications industry.

Status: Active

Assessment Strategies

1.1. Discussion, quiz

Criteria

Learners will be successful when they are able to:

- 1.1. Discuss transmitters and receivers
- 1.2. Discuss peripheral devices
- 1.3. Discuss Telecommunication Networks
- 1.4. Discuss the advancements in the telecommunications industry

Learning Objectives

- 1.a. Discuss various types of cell phone equipment
- 1.b. Identify important milestones of the telecommunications industry

2. Discuss the concepts of radio frequencies and spectrum.

Status: Active

Assessment Strategies

2.1. discussion, quiz

Criteria

Learners will be successful when they are able to:

- 2.1. Define bands
- 2.2. Define frequency
- 2.3. Define channels
- 2.4. Discuss the 9 RF behaviors
- 2.5. Characterize the property of Gain

Learning Objectives

- 2.a. Describe the relationship of Bands, channels, Frequencies
- 2.b. Describe RF behaviors and patterns

3. Apply RF math to determine Antenna power.

Status: Active

Assessment Strategies

3.1. discussion, quiz, written assessment

Criteria

Learners will be successful when they are able to:

- 3.1. Apply the rule of 10 and 3
- 3.2. Compare the relationships between relative and actual comparisons
- 3.3. Calculate the effective isotropic radiated power of an antenna (EIRP)
- 3.4. Define the concept Beamwidth

Learning Objectives

- 3.a. Measure the Effects of dB (decibel) on Power
- 3.b. Determine the effects of isotropic radiated power

4. Compare various wireless transmission technologies.

Status: Active

Assessment Strategies

4.1. discussion, quiz

Criteria

Learners will be successful when they are able to:

- 4.1. Define RF characteristics
- 4.2. Define wireless strengths and weaknesses
- 4.3. Discuss the frequency range
- 4.4. Explain how the antenna propagates RF signal
- 4.5. Discuss OFDM
- 4.6. Discuss DSSS

4.7. Discuss FHSS

Learning Objectives

4.a. Discuss Radio Frequency transmission

4.b. Discuss Microwave transmission

4.c. Compare Narrow band and Spread Spectrum transmission methods

5. Characterize various types of antennas.

Status: Active

Assessment Strategies

5.1. discussion, quiz, case study

Criteria

Learners will be successful when they are able to:

5.1. Discuss radiation patterns (omni-directional and directional)

5.2. Identify components of polar charts

5.3. Read H-plane and E-plane views

5.4. Discuss VSWR

5.5. Describe the effects of mounting on signal loss

5.6. Interpret ingress protection (IP) classifications

Learning Objectives

5.a. Discuss antenna propagation properties specific to a type.

5.b. Read polar charts.

5.c. Discuss proper antenna installation and setup

6. Discuss Small Cell deployment.

Status: Active

Assessment Strategies

6.1. discussion, case study

Criteria

Learners will be successful when they are able to:

6.1. Identify small sites equipment

6.2. Describe small cell infrastructure

6.3. Define low coverage areas

6.4. Explain how small cell improves coverage patterns in denser populated areas

Learning Objectives

6.a. Describe structural components of small cell

6.b. Discuss the need for small cell to densify coverage