ATCW-2030: DATA THEORY

Cuyahoga Community College

Viewing: ATCW-2030 : Data Theory

Academic Term:
Spring 2019

Subject Code
ATCW - AIT-Communication Workers

Course Number:
2030

Title:
Data Theory

Catalog Description:
Advanced course covering the topology and transmitting information related to signal transmission and transport. In addition, purpose and function of information systems will be discussed.

Credit Hour(s):
1

Lecture Hour(s):
1

Requisites

Prerequisite and Corequisite
Departmental approval: admission into the CWA apprenticeship programs.

Outcomes

Course Outcome(s):
I. Interpret the topology related to data theory including the network map and medium.

Objective(s):
1. Compare the parameters associated with network design.
2. Differentiate between the different medium types and topology.
3. Assess the various types of topology use in data theory.
4. Define the terms used with respect to data theory.
5. Review the function and purpose of the network map.

Course Outcome(s):
II. Analyze the process of transmitting information through different signals using different mediums.

Objective(s):
1. Define the terms related to signal transmission.
2. Examine the different signals that are used.
3. Differentiate between analog and digital signals.
4. Appraise the performance restrictions related to medium design.
5. Critique the physical characteristics of the medium.

Course Outcome(s):
III. Compare the purpose and function of the different information systems and explain the relationship between the two.

Objective(s):

1. Define the terms related to information systems.
2. Classify the different types of information networks.
3. Describe how the system function affects the operational capability.
4. Explain how system functions determine the respective type of system used.
5. Compare the components of a network system.
6. Critique the environmental effects on medium and equipment.

Methods of Evaluation:

1. Quizzes
2. Tests
3. Class participation

Course Content Outline:

1. Topology
    a. Types
        i. Star
            1. Hybrid
            2. Hierarchical
        ii. Ring
        iii. Mesh
        iv. Bus
        v. Physical
        vi. Logical
    b. Terminology
        i. Wan
        ii. Lan
        iii. Internet technology
        iv. Topology
        v. Digital subscriber loop
        vi. Backbone
        vii. Network map
        viii. Compass
        ix. Noise
    c. Network map
        i. Function
            1. Loctions
            2. Pathways
            3. Equipment
        ii. Purpose
            1. Transmission
            2. Information
            3. Monitoring
            4. Control
            5. Access
    d. Network design parameters
        i. Distance
        ii. Environment
        iii. Magnetic fields
        iv. Nosie
    e. Medium types versus topology
        i. Similarities
            1. Transmission
            2. Limiting factors
        ii. Variations

1. Design
2. Environmental
3. Uses

2. Transmitting process
   a. Terms
      i. Radio signal
      ii. Optical signal
      iii. Microwave
      iv. Band width
      v. Frequency
      vi. Reciever
      vii. Transmitter
      viii. Amplifier
      ix. Repeated
      x. Router
      xi. Packet
      xii. Switched
      xiii. Digital
      xiv. Analog
      xv. Data
   b. Signal types
      i. Analog
      ii. Digital
      iii. Data packet
   c. Analog versus digital
      i. Distance
      ii. Environmental
      iii. Application
   d. Medium characteristics
      i. Physical
         1. Twisted pair
         2. Optic
         3. Wireless
      ii. Speed
      iii. Band width
      iv. Frequency
      v. Pair count
      vi. Size
3. Information system
   a. Terms
      i. Network
      ii. Voice over internet protocol
      iii. Server
      iv. Transceiver
      v. Switch
   b. System types
      i. Voice
      ii. Data
      iii. Building control
      iv. Safety
      v. Monitor
      vi. Entertainment
      vii. Universal
   c. Operational capability
      i. Infrastructure capabilities
      ii. End user
      iii. Equipment
      iv. System expandability

d. System function
    i. Type
    ii. End user requirements
e. Network systems components
    i. Hardware
    ii. Software
    iii. Medium
    iv. Work stations
f. Environmental effects
    i. Heat
    ii. Humidity
    iii. Temperature
    iv. Magnetism
    v. Physical

Resources

Independent Electrical Contractors Chesapeak and Western Electrical Contractors Association. *Electrical Pre-Apprenticeship Workforce Development.* 2013 Edition. Cengage Learning Clifton Park, NY, 2013.

BICSI. *Information Technology Systems Installation.* 6th Edition. BICSI Tampa, Florida, 2012.

Cisco Press. *Cisco Networking Academy Program – First Year.* Second Edition. Cisco Press Indianapolis, Indiana, 2002.

Resources Other

www.support.microsoft.com/kb/103884 (http://www.support.microsoft.com/kb/103884/)
www.compnetworking.about.com/od/computer-network

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