



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MATT 2710 Shop Floor Networking
1 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Interpret the essential characteristics of industrial communications
 - a. Discuss typical device used in industrial networks and their control/data functions
 - b. Describe the topologies used in industrial networks
 - c. Describe the use of zones for data throughput and control for industrial networks
 - d. Explain Virtual Local Area Networks (VLAN) and their use in industrial networks
 - e. Describe the characteristics of Ethernet Communication
 - f. Describe the architecture of an Ethernet network

2. Determine the characteristics of Ethernet Communications
 - a. Describe the architecture of an Ethernet network
 - b. List the core TCP/IP protocols
 - c. Explain data packets and transmissions methods
 - d. Explain the protocols as defined by the common protocols associated with the TCP/IP internetwork layer.
 - e. Explain the Transport layer protocols
 - f. Describe static and Dynamic Host Configuration Protocol (DHCP) addressing
 - g. Define the differences between network hubs and switches
 - h. Explain Routing protocols
 - i. Explain wireless IP communications

3. Analyze the devices and usage of Serial Communications
 - a. Describe the architecture of an industrial serial network
 - b. Explain point-to-point and multicast serial communications protocols
 - c. Configure devices for serial communications
 - d. Configure an Ethernet Communications Module. Interpret diagnostic indicators status related to the modules functionality
 - e. Perform the replacement procedure for the following modules:
 - i. DeviceNet Communications module
 - ii. DeviceNet Input Node
 - iii. DeviceNet Output Node
 - f. Configure a ProfiNet Communications Module. Interpret diagnostic indicators status related to the modules functionality

4. Classify the devices and usage of ProfiNet and Ethernet/IP communications
 - a. Describe the architecture of an industrial Ethernet network
 - b. List the specifications for industrial Ethernet communications
 - c. Explain the requirements for the installation of industrial Ethernet communications
 - d. Explain the use of unmanaged and managed switches for industrial Ethernet communications
 - e. Describe the purpose and use of ring redundancy for industrial Ethernet communications
 - f. Configure devices for industrial Ethernet communications

 5. Classify the devices and usage of ProfiBus and DeviceNet Communications
 - a. Describe the architecture of an industrial field bus network
 - b. Explain the requirements for the installation of industrial field bus communications
 - c. Describe the communication modes for field bus networks
 - d. Configure devices for industrial field bus communications

 6. Identify data usage of field devices in industrial networks
 - a. Describe the use of data for programmable controllers
 - b. Describe the use of data for HMIs and operator interface devices
 - c. Describe the use of data for robots
 - d. Describe the use of data for machine tools
 - e. Describe the use of data for other devices, such as, inspection, part readers, and tooling
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These SLOs are not approved for experiential credit.

Effective: Fall 2017