

## **EE 519- Industrial Communication Networks**

### **CREDIT HOURS**

3 Hours

### **CONTACT HOURS (Hours/week)**

Lecture: 2; Tutorial/ Lab: 2

### **COURSE COORDINATOR**

Dr Hassan Ibrahim

### **TEXT BOOK:**

B.G. Liptak, 'Process Software and Digital Networks: (CRC Press ISA- The Instrumentation, Systems, and Automation Society).

### **COURSE DESCRIPTION:**

Data Communication basics, OSI reference model, Industry Network, Recent networks, Introduction to Communication Protocols, Communication basics, Network Classification, Device Networks, Control Networks, Enterprise Networking, Network selection, Network Architectures, Modbus, Fieldbus, Trends Hardware selection, HART, Wireless Protocols, ZigBee, Z-wave.

### **PREREQUISITE:**

EE 512

### **RELATION OF COURSE TO PROGRAM:**

Elective

### **COURSE INSTRUCTION OUTCOMES:**

The student is introduced to different types of Industrial Communication networks. It provides the student with practical training with some famous networks.

### **TOPICS COVERED:**

- Data Communication basics
- OSI reference model
- Industry Network
- Recent networks
- Communication Protocols
- Device Networks
- Control Networks
- Enterprise Networking
- Network selection
- Network Architectures

- Modbus and Fieldbus
- Trends Hardware selection
- HART
- Wireless Protocols
- ZigBee and Z-wave

**CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:**

<b>Professional Component Content</b>			
<b>Math and Basic Sciences</b>	<b>Engineering Topics</b>	<b>General Education</b>	<b>Engineering Design</b>
	√	√	√

**RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:**

<b>Student Outcomes</b>		<b>Course Outcomes</b>
<b>a.</b>	An ability to apply knowledge of mathematics, science, and engineering.	√
<b>b.</b>	An ability to design and conduct experiments, analyze and interpret data.	√
<b>c.</b>	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	
<b>d.</b>	An ability to function on multi-disciplinary teams.	
<b>e.</b>	An ability to identify, formulate, and solve engineering problems.	√
<b>f.</b>	An understanding of professional and ethical responsibility.	
<b>g.</b>	An ability to communicate effectively.	
<b>h.</b>	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal content	
<b>i.</b>	A recognition of the need for, and an ability to engage in life-long learning.	
<b>j.</b>	A knowledge of contemporary issues within and outside the electrical engineering profession.	√
<b>k.</b>	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	√