



COURSE OUTLINE

RAA102

Prepared: Mark Allemang and Ron Chartrand Approved: Corey Munier

Course Code: Title	RAA102: COMPUTERS AND NETWORKING						
Program Number: Name	4068: ROBOTICS AUTOMATION						
Department:	ROBOTICS GRADUATE CERTIFICATE						
Semester/Term:	17F						
Course Description:	This course covers communication networks used in the automation industry and focuses on various fieldbus communications of main and peripheral equipment.						
Total Credits:	2						
Hours/Week:	2						
Total Hours:	30						
This course is a pre-requisite for:	RAA202, RAA203, RAA204						
Vocational Learning Outcomes (VLO's):	#2. Plan and lead the installation of new industrial equipment and its physical and digital integration with existing systems.						
<small>Please refer to program web page for a complete listing of program outcomes where applicable.</small>							
Essential Employability Skills (EES):	#4. Apply a systematic approach to solve problems.						
Course Evaluation:							
Evaluation Process and Grading System:	<table border="1"> <thead> <tr> <th>Evaluation Type</th> <th>Evaluation Weight</th> </tr> </thead> <tbody> <tr> <td>Assignments</td> <td>20%</td> </tr> <tr> <td>Tests</td> <td>80%</td> </tr> </tbody> </table>	Evaluation Type	Evaluation Weight	Assignments	20%	Tests	80%
Evaluation Type	Evaluation Weight						
Assignments	20%						
Tests	80%						
Course Outcomes and Learning Objectives:	<p>Course Outcome 1.</p> <p>Utilize various Basic Terminology, and describe the Concepts of a Computer Network</p>						



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Learning Objectives 1.

- Define a network
- Define and distinguish LAN, WAN, CAN, MAN
- Compare and contrast various types of networks including client/server, peer to peer
- Describe the term NOS network operating systems
- Describe physical topologies (bus,ring,star), and associated media access control methods (logical topology)
- Compare circuit switching and packet switching
- Differentiate simplex, full/half duplex
- List and describe the 7 layers of the OSI model and
- Compare them to the 4 layers of the TCP/IP model
- Identify various protocols at each layer and describe their purpose
- Identify the method of addressing at various layers and the associated protocol data units
- Identify the network devices at various layers and describe their role in the network.
- List the advantages of industrial networked computing relative to islands of automation
- Identify, List and describe the elements of an industrial/Robotic network
- Explain Basic Industrial/Robotic Network Terminology and Concepts
- Describe several specific uses for Industrial networks
- Identify and Distinguish between different Data communications standards such as, RS-232 interface standard, RS-485 interface standard
- State the importance of the ISO OSI model and how it applies to the Industrial/Robotic Networks discussed in this course

Course Outcome 2.

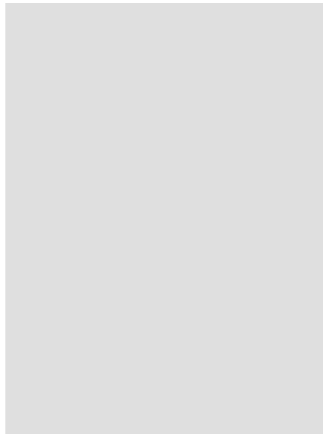
Describe the characteristics of Ethernet IP based networks

Learning Objectives 2.

- State the application advantages and limitations of Industrial Ethernet in today's modern industries
- Describe how industrial Ethernet-IP systems operate
- Compare wired to wireless industrial networking
- Identify Industrial Ethernet-IP Network cable types and uses
- Identify Industrial Ethernet-IP Network troubleshooting
- Describe the terms Electrical Coupling Grounding and Shielding as they applies to Industrial



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networks.

Course Outcome 3.

Describe the characteristics of Device Net based networks.

Learning Objectives 3.

- Identify Devicenet Applications and place in in a typical plant Hierarchy
- Identify Frame Format and Network Characteristics
- Identify Devicenet Configuration and Network Components
- Explain Devicenet Addressing and Topology
- Discuss Installation ,commissioning and troubleshooting
- Identify the Types & Media characteristics

Date:

Friday, September 1, 2017



Please refer to the course outline addendum on the Learning Management System for further information.