Department of Industrial and Engineering Technology

Course number: EMT 455

Credit hours: Four Semester Hours

I. Title: Manufacturing Control Systems

II. Catalog Description:

This course is a capstone integration course designed to apply manufacturing equipment control and data acquisition systems to plant operations using current plant-floor integration software. This course will focus on the development and integration of local area networks (LAN) and wide area networks (WAN) with industrial control processes. The topics included in this course are: local area networks (LAN), industrial networks, programmable logic controllers, man-machine interfaces, serial device networks, and supervisory and data acquisition (SCADA) systems.

III. Purpose:

The purpose of this course is to provide the student with more comprehensive methodology of the integration of manufacturing processes into the business function.

IV. Course Objectives:

A. General Course Objectives

The overall objective of this course is to introduce the student to the technologies that currently exist that allow manufacturing processes to be controlled and monitored for the purpose of maintenance management, operations management, financial management and various other aspects of the business function.

B. Specific Objectives:

As a result of this course each student will:

(1) Understand the network hierarchy of an industrial enterprise.

(2) Have an understanding of the issues involved in control and monitoring of industrial processes

(3) Understand the network technology involved from the control of the process to the management of the data.

(4) Design and implement a simple machine control and data acquisition system.

V. Course Outline:

RSLinx Communications Server

a) RSLinx Versions
b) Direct Connect, DH+, Ethernet
c) DDE, OPC
d) RSLinx Gateways

Operator Interface MMI

a) SLC504 Review
b) Panel View Software
c) Objects and Tags
d) DH+ Network Communications

Supervisory Control & Data Acquisition

a) RSView Software
b) Node & OPC connections
c) Data Structure and Tags
d) Objects & Animation
e) Data Logging and Trending

Control Logix 5000

a) Networking Concepts,
b) Communications Hardware
c) Programming, Data Structures, Producer-Consumer
d) Ethernet/IP Design and Configuration

Instructional Activities:

Course will consist of lecture on the basic topics, laboratory skill exercises and quizzes, and project design integration and documentation.

VII. Field and Clinical Experiences:

None

VIII. Resources:

Motion Control Laboratory
Industrial Networking Laboratory
Operational Components
Computer Laboratory
Computer Software

IX. Grading

		100%-90%-A
Daily Lab Work (Exercises & Quizzes)	50%	80%-89%-B
Mid Term Exam	20%	70%-79%-C
Project Design & Documentation	30%	60%-69%-D
	100%	59%- 0%-E

X. Attendance:

Attendance is required at all lectures and laboratories.

XI. Academic Honesty Policy:

Cheating, plagiarism, submitting another person's material as one's own, or doing work for another person who will receive academic credit are all impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, laboratory reports, drawings or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may result in failure of the course.

XII. Required Text(s) and Manuals(s):

Current Software Manuals

Reference Texts:

Allen Bradley & Rockwell Software Online Technical Manuals

XIII. Prerequisites:

CSC 232, TSM 232, TSM 241, EMT 310

XIV. Statement of Affirmative Action and Equal Opportunity:
Murray State University does not discriminate on the basis of race, color, national origin, sex, religion, marital status, age, or disability in employment, admission, or the provision of services, educational programs and activities, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities. For information regarding policies, contact the Office of Equal Opportunity at (270) 809-3155.

Fall 2011 – Benson

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Term: Fall '08

Assignments

Date	Chapter	Problems/Lab