COURSE OUTLINE

DIVISION: Career and Technical Programs

COURSE: ELT-2210; HMI, SCADA & Fiber Optics

Date: 1/20/2011

Credit Hours: 3

Prerequisite(s): ELE 1204

Delivery Method:
- Lecture 2 Contact Hours (1 contact = 1 credit hour)
- Lab 2 Contact Hours (2 contact = 1 credit hour)
- Clinical 0 Contact Hours (3 contact = 1 credit hour)

Offered: Fall

IAI Equivalent – Only for Transfer Courses - go to http://www.itransfer.org:

CATALOG DESCRIPTION:
This Course Is a continuation of the PLC automation classes utilizing software and hardware to build and use a Human Machine Interface (HMI) and the introduction of the System Control and Data Acquisition (SCADA) system.
GENERAL EDUCATION GOALS ADDRESSED
[See the last page of this form for more information.]

Upon completion of the course, the student will be able:
[Choose those goals that apply to this course.]

☐ To apply analytical and problem solving skills to personal, social and professional issues and situations.
☐ To communicate orally and in writing, socially and interpersonally.
☐ To develop an awareness of the contributions made to civilization by the diverse cultures of the world.
☐ To understand and use contemporary technology effectively and to understand its impact on the individual and society.
☒ To work and study effectively both individually and in collaboration with others.
☐ To understand what it means to act ethically and responsibly as an individual in one’s career and as a member of society.
☐ To develop and maintain a healthy lifestyle physically, mentally, and spiritually.
☒ To appreciate the ongoing values of learning, self-improvement, and career planning.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:
[Outcomes related to course specific goals.]

Upon completion of the course, the student will be able to:
Competency 1 Basics of HMI
   Competency 1.1 Interpret a control Panel
   Competency 1.2 Build a simulated Control Panel
   Competency 1.3 Create a Scenario-based Display
   Competency 1.4 Animate the display
   Competency 1.5 Create an Alarm screen
Competency 2 Basics of SCADA
   Competency 2.1 Explain system control
   Competency 2.2 interpret Data
   Competency 2.3 Apply software to Trend DATA
   Competency 2.4 Describe DATA security
Competency 3 Maintenance and Troubleshooting
   Competency 3.1 Interpret HMI alarm messages
   Competency 3.2 Troubleshoot and repair a Fiber Optic Cable
   Competency 3.3 Predict System Performance
   Competency 3.4 Document Maintenance, CQI

COURSE TOPICS AND CONTENT REQUIREMENTS:
HMI history
HMI justification
A Process
Important DATA
Displays
Objects and symbols
Alarms
Animation
Process Controllers
Trends
Best Practices
Communication over Fiber
System Control
Data Acquisition
Securing DATA
Continuous Quality Control
Maintenance Documentation

INSTRUCTIONAL METHODS:
Lecture
Lab
Simulation
Group work

INSTRUCTIONAL MATERIALS:

Automation Studio Software
Rockwell Automation Studio Software
AB Panel View Hardware

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:
90% and up  A
80% - 89%  B
70% - 79%  C
60% - 69%  D
00% - 59%  F

Quizzes  10%
Labs  30%
Tests  20%
Midterm  20%
Final  20%

Some quizzes and test may be performance based

OTHER REFERENCES

www.ab.com
### Course Competency/Assessment Methods Matrix

**ELT-2210; HMI, SCADA, & Fiber Optics**

For each competency/outcome place an “X” below the method of assessment to be used.

<table>
<thead>
<tr>
<th>Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.</th>
<th>Direct/Indirect</th>
<th>Assessment of Student Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Interpret a control Panel</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>1.3 Create a Scenario-based Display</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>1.4 Animate the display</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>1.5 Create an Alarm screen</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>2.1 Explain system control</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>2.2 Interpret Data</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>2.3 Apply software to Trend DATA</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>2.4 Describe DATA security</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
<tr>
<td>3.1 Interpret HMI alarm messages</td>
<td>Direct</td>
<td>Article Review</td>
</tr>
</tbody>
</table>