Date: Fall 2013

Credit Hours: 2.5

Prerequisite(s): ELE 1200 or ELT 1204

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

Offered: Fall Spring Summer

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

CATALOG DESCRIPTION:
Principles of operation and control of DC and single phase AC motors and generators are studied. Additional topics include: J.I.C. symbols, power and control wiring in ladder diagram format, and wiring techniques for forward-reverse and speed-control operations. Troubleshooting techniques will be emphasized throughout this course.
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:

Outcome 1 Choose the right tool for the task
  Competency 1.1 Choosing the proper Screw Drivers
  Competency 1.2 Choosing the proper Pliers
  Competency 1.3 Choosing the right Wrenches
  Competency 1.4 Choosing the right Miscellaneous tools

Outcome 2 Properly use the correct Test Instruments
  Competency 2.1 Using a Voltage tester
  Competency 2.2 Using a test lead set
  Competency 2.3 Using a Phase sequence tester
  Competency 2.4 Using the Oscilloscope

Outcome 3 State and Use proper Electrical Safety procedures
  Competency 3.1 Properly inspect and use a ground
  Competency 3.2 Properly find codes in using the NEC
  Competency 3.3 Correctly interpret data from a motor name plate
  Competency 3.4 Pass a Safety Exam on Fuses, GFI’s, Shock, Lockout/Tagout clothing and personal Equipment, and Fire safety

Outcome 4 Correctly interpret symbols on a line diagram
  Competency 4.1 Correctly choose components based on a line diagram
  Competency 4.2 Correctly write a line diagram from a wired circuit
Outcome 5   Use logic to Predict to outcomes based on line diagrams
   Competency 5.1  Convert wiring diagrams to line diagrams
   Competency 5.2  Program a Manual control circuit
   Competency 5.3  Program an Automatic control circuit
   Competency 5.4  Correctly use Line numbers and the Cross-Reference System
   Competency 5.5  Properly use Wire and Manufacturer's Terminal Numbers

Outcome 6   Properly choose and wire AC Contactors and Starters
   Competency 6.1  Define a Contact and a Starter
   Competency 6.2  Properly choose and Install a Manual Contactor
   Competency 6.3  Properly choose and install a Manual Starter

Outcome 7   Explain the relationship between Magnetism and Solenoids
   Competency 7.1  Properly state and use the FBI rule
   Competency 7.2  Define Magnetism
   Competency 7.3  Define a Solenoid
   Competency 7.4  Apply Solenoid rules for proper selection
   Competency 7.5  Correctly Troubleshoot a Solenoid Circuit

Outcome 8   Properly use Time delay relay in a logic circuit
   Competency 8.1  Explain the uses for the Timing Functions
   Competency 8.2  Correctly wire a timing circuit from a Line Diagram
   Competency 8.3  Program a line diagram to perform a given task
   Competency 8.4  Correctly Troubleshoot a Timing Circuit

Outcome 9   Properly use Quality terms and technics
   Competency 9.1  Properly develope a working definition for Quality
   Competency 9.2  Properly Benchmark the quality of a product
   Competency 9.3  Perform Quality testing and Analisis

COURSE TOPICS AND CONTENT REQUIREMENTS:
I.  Electrical Tool, Instruments, and Safety

II.  Industrial Electrical Symbols and Line Diagrams

III.  Introduction to Logic as Applied to Line Diagrams

IV.  AC Manual Contactors Motor Starters

V.  Magnetism and Magnetic Solenoids

VI.  AC/DC Contactors and Magnetic Motor Starters

VII. Time Delay and Logic Applied to More Complex Line Diagrams and Control Circuits

VIII  Quality
INSTRUCTIONAL METHODS:
1. Laboratory work
2. Demonstrations
3. Lecture - discussion
4. Reading assignments
5. Homework
6. Quizzes
7. Team Work
8. Socratic Method

INSTRUCTIONAL MATERIALS:
Lab Manual
Quality Foundations, Constable, Hershey, Houdeshell, Seery, Sinclair Community College, 1998

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:
The student must meet the objectives of the course stated previously.
Laboratory reports must be completed as directed and receive an evaluation for accuracy of 70% or more using criteria set forth in the laboratory directions.

Required assignments: Methods of Evaluation:
Mandatory lab attendance Team projects
Weekly lab assignments Short quizzes
Assigned reading Midterm exams
Lab practical exams Completion of homework assignments
Final exam Midterm, final, and lab final exams
Tests
Laboratory work 50%
Written tests and quizzes 30%
Attendance 10%
Homework assignments 10%

OTHER REFERENCES
Library
Internet sites
Product Vendors
“This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use, by an organization and/or personal use by an individual for non-commercial purposes, is permissible. All other uses require the prior authorization of the copyright holder.”
## Course Competency/Assessment Methods Matrix

### ELE 1202: Motors and Controls I

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>Assessment Options</th>
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**Competency 1.1** Choosing the proper Screw Drivers

**Competency 1.2** Choosing the proper Pliers

**Competency 1.3** Choosing the right Wrenches

**Competency 1.4** Choosing the right Miscellaneous tools

**Competency 2.1** Using a Voltage tester

**Competency 2.2** Using a test lead set

**Competency 2.3** Using a Phase sequence tester

**Competency 2.4** Using the Oscilloscope

**Competency 3.1** Properly inspect and use a ground

**Competency 3.2** Properly find codes in using the NEC

**Competency 3.3** Correctly interpret data from a motor name plate
For each competency/outcome place an “X” below the method of assessment to be used.

| Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below. | Direct/Indirect | Assessment of Student Learning | Assessment Options |
|---|---|---|---|---|
| Competency 3.4 Pass a Safety Exam on Fuses, GFI’s, Shock, Lockout/Tagout | D | Article Review | X |
| Competency 4.1 Correctly choose components based on a line diagram | I | Case Studies | X |
| Competency 4.2 Correctly write a line diagram from a wired circuit | D | Group Projects | X |
| Competency 5.1 Convert wiring diagrams to line diagrams | I | Lab Work | X |
| Competency 5.2 Program a Manual control circuit | D | Oral Presentations | X |
| Competency 5.3 Program an Automatic control circuit | I | Pre-Post Tests | X |
| Competency 5.4 Correctly use Line numbers and the Cross-Reference System | D | Written Exams | X |
| Competency 5.5 Properly use Wire and Manufacturer's Terminal Numbers | I | Artifact Self Reflection of Growth | X |
| Competency 6.1 Define a Contact and a Starter | D | Comprehensive Written Exit Exam | X |
| Competency 6.2 Properly choose and Install a Manual Contactor | I | Capstone Projects | X |
| | | Course Embedded Questions | |
| | | Multi-Media Projects | |
| | | Observation | |
| | | Writing Samples | |
| | | Portfolio Evaluation | |
| | | Real World Projects | |
| | | Reflective Journals | |
| | | Applied Application (skills) Test | |
| | | Oral Exit Interviews | |
| | | Accreditation Reviews/Reports | |
| | | Advisory Council Feedback | |
| | | Employer Surveys | |
| | | Graduate Surveys | |
| | | Internship/Practicum/Site Supervisor Evaluation | |
| | | Licensing Exam | |
| | | In Class Feedback | |
| | | Simulation | |
| | | Interview | |
| | | Written Report | |
| | | Written Assignment | |
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For each competency/outcome place an “X” below the method of assessment to be used.

| Competency 9.2  Properly Benchmark the quality of a product | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X |
| Competency 9.3  Perform Quality testing and Analisis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X |