ETI236 Industrial Control

I. CATALOGUE DESCRIPTION

A. Pre-requisite: ETC104 AC Circuits with a grade of “C” or better and Reading Proficiency

B. 4 Credit Hours

C. Industrial Control involves a study of AC and DC motor theory, as well as control devices and symbols, ladder diagrams, common motor control circuits, sensors and transducers, open and closed-loop process control, and synchro components. (F,S)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Demonstrate knowledge and understanding of the concepts and characteristics of the various types of DC and AC motors</th>
<th>Written Exams Quizzes Hands-On Exercises Homework</th>
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<tr>
<td>Demonstrate knowledge and understanding of both mechanical and solid state control devices</td>
<td>Written Exams Quizzes Hands-On Exercises Homework</td>
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<tr>
<td>Demonstrate the ability to read, analyze, and effectively implement electrical schematics in regards to understanding and troubleshooting an industrial control system</td>
<td>Written Exams Quizzes Hands-On Exercises Homework</td>
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<tr>
<td>Demonstrate knowledge and understanding of the concepts and characteristics of the various types of sensors and input devices associated with most industrial control systems</td>
<td>Written Exams Quizzes Hands-On Exercises Homework</td>
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<tr>
<td>Demonstrate the ability to construct, analyze and implement various control devices into an existing industrial control system</td>
<td>Written Exams Quizzes Hands-On Exercises Homework</td>
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<tr>
<td>Identify digital logic symbols and logic functions and state the purpose of their application in electrical control diagrams and schematics</td>
<td>Written Exams Quizzes Hands-On Exercises Homework</td>
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III. OUTLINE OF TOPICS

A. Symbols & Diagrams
   1. Interpret and create electrical symbols and diagrams
   2. Identify and describe electrical transformer operation

B. Control Logic
   1. Read and develop control logic
   2. Describe digital control logic functions
   3. Identify and create relay control logic circuitry

C. Mechanical Input & Output Control Devices
   1. Recognize and describe mechanical input control devices
   2. Recognize and describe solid-state input control devices
   3. Recognize and describe mechanical output control devices

D. Electrical Motors & Generators
   1. Describe DC motor and generator operation and applications
   2. Describe AC motor and generator operation and applications
   3. Describe and recognize the applications of contactors and magnetic motor starters
   4. Identify and program variable frequency motor drives

E. Advanced Control Functions
   1. Recognize and describe automated timing and counting functions
   2. Identify and troubleshoot open and closed loop electrical control systems

IV. METHOD(S) OF INSTRUCTION

A. Lectures
B. Textbook Reading
C. Demonstrations
D. Hands-On Activities

V. REQUIRED TEXTBOOK(S)

VI. REQUIRED MATERIALS

None

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHOD OF EVALUATION

A. Written Exams
B. Quizzes
C. Hands-On Exercises
D. Homework
E. Attendance
   A = 90-100%
   B = 80-90%
   C = 70-80%
   D = 60-70%
   F = Below 60%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, http://www.jeffco.edu)
XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.