Course Information

Division: Industrial Technology Education
Course Number: ELT 111
Title: DC Electrical Systems
Credits: 3
Developed by: Charles A. Smith
Lecture/Lab Ratio: 1 Lecture/4 Lab
Transfer Status:

<table>
<thead>
<tr>
<th></th>
<th>ASU</th>
<th>NAU</th>
<th>UA</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET</td>
<td>Departmental</td>
<td>CTE</td>
<td>Non</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>Departmental</td>
<td>Transferable</td>
</tr>
</tbody>
</table>

Activity Course: No
CIP Code: 47.0105
Assessment Mode: Pre/Post Test (90 Questions/100 Points)
Semester Taught: Fall
GE Category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
None

Educational Value
A. To General Education: Elective Credit
B. To other courses or curricula: This course is a curriculum requirement for the Electrical and Instrumentation Technician Certificate.

Description
This course is an introductory course of direct current theory and systems with a heavy emphasis on industrial applications and setting. Students will be introduced to batteries, DC circuits, electrical test and measuring equipment, various conductors, semiconductors, insulators, as well as developing troubleshooting skills.

Supplies
Scientific calculator
**Competencies and Performance Standards**

1. **Examine the characteristics of Direct Current Electricity**
   
   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Analysis of conductor types.
   b. Analysis of insulation types.
   c. Classify and compare various wire gauges.
   d. Evaluation of conductor ampacities.
   e. Demonstrate basic troubleshooting skills.

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   o in class discussion
   o in group practice
   o in use of model electrical circuits
   o in written test

   *Criteria - Performance will be satisfactory when:*
   
   o learner completes written test to 70% correct
   o learner manipulates model circuit to accomplish assigned task

2. **Implementation of Direct Current Measuring and Test Equipment**
   
   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Demonstrate how to read voltage, current, and resistance in a DC circuit.
   b. Demonstrate proper use of a voltmeter.
   c. Demonstrate proper use of an ammeter.
   d. Demonstrate proper use of an ohmmeter.
   e. Use of DC power supplies.
   f. Explain battery types.
   g. Describe how to load test a battery.
   h. Explain the use of hydrometer to test a battery.

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   o in class discussion
   o in group practice
   o in use of test equipment
   o in written test

   *Criteria - Performance will be satisfactory when:*
   
   o learner correctly demonstrates correct and safe use of test equipment
   o learner correctly identifies battery types and battery configurations
3. **Analysis of Electromagnetism**

*Learning objectives*

*What you will learn as you master the competency:*

a. Describe the components of a relay.

b. Comprehension of principles of magnetism.

c. Demonstrate the use of relays.

*Performance Standards*

*Competence will be demonstrated:*

- in class discussion
- in group practice
- in use of model electrical circuits
- in written test

*Criteria - Performance will be satisfactory when:*

- learner completes written test to 70% correct
- learner manipulates model circuit to accomplish assigned task

**Types of Instruction**

Lecture/modeling

Electrical lab assignments

Group practice

Individual projects/presentations

**Grading Information**

**Grading Rationale**

- Final Exam - 35%
- Chapter Exams – 35%
- Lab Assignments – 20%
- Attendance – 10%

**Grading Scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90%-100%</td>
</tr>
<tr>
<td>B</td>
<td>80%-89%</td>
</tr>
<tr>
<td>C</td>
<td>70%-79%</td>
</tr>
<tr>
<td>D</td>
<td>60%-69%</td>
</tr>
<tr>
<td>F</td>
<td>Below 60%</td>
</tr>
</tbody>
</table>