

**ELEC 102-ELECTRICAL & INSTRUMENTATION TECHNOLOGY**

**Credit Hours:** 3

**Scheduled hours per week**

Lecture: 2

Lab: 2

Catalog Course Description: Provides an introduction to electrical theory, safety, Electrical & Instrumentation (E&I) testing and process technologies. Laboratory exercises are designed to provide hands-on practice of concepts.

**Pre-requisites:** None

**Co-requisites:** None

**Course Learning Outcomes:**

- Students demonstrate a basic knowledge of industrial safety for E&I personnel
- Students demonstrate the use of hand tools, power tools, and test instruments
- Students relate the use of DC & AC electrical theory, including Ohm’s Law, series and parallel circuits, and circuit current, voltage, and power analysis
- Student explain the layout and types of information found in the National Electric Code

**Topics to be studied:**

- Electrical safety
- Introduction to electrical circuits
- Electrical theory
- Introduction to the National Electric Code
- Electrical test equipment

<b>Relationship of Course to Program or Discipline Learning Outcomes:</b>	
Demonstrate basic understanding of electrical safety.	X
Show understanding of and uses of terminology, measuring systems, hand and power tools, mechanical instruments, lathes, mills and measuring tools and instruments.	X
Demonstrate basic comprehension of electrical theory and National Electric Code.	X
Interpret parameters relating to pressure, level, flow, and temperature measurement.	
Differentiate various electronic components and uses in circuitry.	
Compare and contrast AC & DC motors, transformers and distribution equipment.	
Summarize understanding of transducers, actuators, and controllers.	
Demonstrate ability to calibrate and configure process loops.	
Show use of PLCs, data networks, and DCSs.	

Demonstrate ability to write concise and accurate reports.	
Summarize comprehension of fractions, decimals, and percentages.	X
Solve algebraic equations.	X
Differentiate between of area and volume and calculate both.	
Read blue prints and schematics and use effectively in installation and trouble-shooting scenarios.	
Successfully execute Level 4 E & I NCCER Certification Project.	

For general education courses, a listing of the general education competencies that are met.)

<b>Relationship of Course to General Education Learning Outcomes:</b>	
<b>Composition and Rhetoric</b> Students illustrate a fundamental understanding of the best practices of communicating in English and meet the writing standards of their college or program-based communication requirements.	X
<b>Science &amp; Technology</b> Students successfully apply systematic methods of analysis to the natural and physical world, understand scientific knowledge as empirical, and refer to data as a basis for conclusions.	X
<b>Mathematics &amp; Quantitative Skills</b> Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.	X
<b>Society, Diversity, &amp; Connections</b> Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.	
<b>Human Inquiry &amp; the Past</b> Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills.	
<b>The Arts &amp; Creativity</b> Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.	
<b>5/3/2016</b>	

**Special requirements of the course:**

(All NCCER exams must be passed with minimum 70% score

**Additional information:**

**Prepared by:** G.E. Rowley

**Date:** 10/20/2017