Degree Applicable

Glendale Community College
November 2014

COURSE OUTLINE

Industrial Technology 201
CAQI/QM/QS Electrical Module

I. Catalog Statement

Industrial Technology 201 examines electrical theory, schematic diagrams, and electrical components common to air conditioning and heating systems. The knowledge gained will be used to effectively understand and troubleshoot systems and components.

Total Lecture Units: 1.0
Total Course Units: 1.0

Lecture Hours: 16.0
Total Faculty Contact Hours: 16.0

Recommended Preparation: Eligibility for ENGL 120 or ESL 151.

II. Course Entry Expectations

Prior to enrolling in the course, the student should be able to:
1. summarize, analyze, and synthesize information, express and apply standards for judgment, compare and contrast, and evaluate evidence in order to form and state reasoned opinions;
2. demonstrate a command of grammar, diction, syntax, and mechanics sufficient for college level work: control of standard English at the sentence level, with few major errors in grammar and punctuation.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:
1. identify the electrical components;
2. understand electrical schematic diagrams;
3. troubleshoot electrical systems.

IV. Course Content — Total Faculty Contact Hours = 16

A. Electrical Theory — 4 hours
   1. Electron flow: electricity and magnetism
   2. Single vs. three phase power
   3. Power transmission

4. Ohm's Law, power factor, conductors
5. Grounds and safety
6. Electrical symbols
7. Transformers, thermostats, circuits
8. Schematic diagrams

B. Electric Motors 4 hours
1. Motor operation information
2. AC and DC motors
3. Single phase and three phase electric motors
4. Multiple speed electric motors
5. Reversing rotation of motors

C. Electrical Protection and Control 4 hours
1. Service disconnects, fuses, and control relays
2. Contractors and magnetic starters
3. Air proving and pressure switches
4. Time delay relay and compressor lockout relays
5. Heat pump defrost controls and head pressure controls
6. Lube protection switches
7. Line voltage monitors and current overloads
8. Integrated furnace, economizer, and demand ventilation controls

D. Schematics and Troubleshooting 4 hours
1. Anatomy of a schematic
2. Practical application of schematics
3. Schematic navigation
4. Electrical troubleshooting

V. Methods of Instruction

The following instructional methodologies may be used in the course:
1. lecture;
2. demonstrations;
3. multi-media.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:
1. schematic (e.g. draw a schematic of an electrical module);
2. essay (e.g. describe the system diagnostic process).

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:
1. quizzes;
2. final examination.

VIII. Textbook

Institute of Heating and Air Conditioning Industries, Inc. *IHACI – Electrical Module.* Glendale: Institute of Heating and Air Conditioning Industries 2014. Print.
12th Grade Textbook Reading Level.

IX. Student Learning Outcomes

Upon successful completion on the required coursework, the student will be able to:
1. demonstrate electron flow, Ohm's Law, circuits, and schematic diagrams;
2. know how to troubleshoot electrical problems;
3. demonstrate uses for schematics.