COURSE INFORMATION FORM

DISCIPLINE          HVAC
COURSE TITLE        Electricity for HVAC/R Technicians
CR.HR              4   LECT HR.  2   LAB HR.  4   CLIN/INTERN HR.  _______   CLOCK HR.  _______

CATALOG DESCRIPTION
Advanced AC theory, control relays, motors and compressors. Assembly and use of all major HVAC components. Construction and use of wiring diagrams.

PREREQUISITES
None

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:
1. Demonstrate the ability to work cautiously and safely with electricity.
2. Define electricity.
3. Calculate and use Ohm’s Law to solve electrical problems.
4. Use a volt-ohm meter and determine electrical circuit measurements.
5. Demonstrate an understanding of and measure circuit parameters for single-phase and three-phase power.
7. Demonstrate an understanding of and measure inductive and capacitive reactance to determine circuit impedence.
8. Demonstrate an understanding of theory and operation of single-phase motors.
9. Demonstrate an understanding of theory and operation of three-phase motors.
10. Calculate values of voltage, current, and turns, ratio for single and three phase transformers, connect and test for proper operation.
11. Connect and test a control transformer.
12. Demonstrate an understanding of the principle of operation and voltage and current relationship of a control transformer.
13. Describe and connect the common type of motor starting relays.
14. Define, connect, and troubleshoot low voltage thermostats.
15. Test wire blowers, fan motors and compressors.
16. Demonstrate an understanding of and draw electrical schematics.
17. Demonstrate an understanding of the business community.
GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
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<tr>
<th>Outcomes</th>
<th>ESO</th>
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PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

1. Student will demonstrate the ability to apply foundational skills in an industrial setting safely and to industry guidelines.
2. Student will think critically and apply problem-solving skills.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Quizzes and written exams (1 – 16)
2. Homework and classroom exercises (1 – 16)
3. Student participation and in-class discussions (1 – 17)
4. Lab assignments (1 – 16)

Revised 4/15/13
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Basic Electricity
   A. Atomic Structure
   B. Ohm’s Law
   C. Electrical Circuits
   D. Inductance and capacitance

II. Control Circuits
   A. Schematics and wire diagrams
   B. Wire size and voltage drop

III. Single-phase Motors
   A. Split-phase motors
   B. Shaded pole motor
   C. Multi-speed motors

IV. Three-phase motors
   A. Three-phase motor principles
   B. Squirrel-cage motor

V. Control Components
   A. Overloads
   B. Relays, contractors and motor starters
   C. Control transformer
   D. Starting relays
   E. Thermostat, pressure switches, limits switches