II. Catalog Description

An entry-level course designed to provide the student with the essentials of DC and AC electricity, as well as the necessary electrical background to pursue the more advanced instrumentation and control courses. Instruction will also include instructor-directed bench work and hands-on work on trainers using the latest in electrical instrumentation to introduce the student to basic electrical testing and troubleshooting procedures.
III. Statement of Course Need

A. Technicians in the Environmental Control Technology field are vital to maintaining physical comfort within our residences. Understanding electrical principles is necessary for students that will apply these principles to functioning Environmental Control Technology equipment in advanced classes and are integral elements for the education of well-trained technicians in the Environmental Control Technology field.

B. Extensive hands-on work in the form of laboratory activities is necessary to familiarize students with basic electrical troubleshooting procedures and best-practices followed by professionals in the field and expected of candidates that want to enter this field of work. Lab activities include, but are not limited to: tool/tester/instrument familiarization and proper use techniques; circuit component identification, assembly/disassembly, troubleshooting and repair procedures.

C. This course generally transfers as a free elective, but it also serves as a Program Elective to Pennsylvania College of Technology for those students graduating with the AAS in Environmental Control Technology who are interested in pursuing B.S. degree at that institution.

IV. Place of Course in College Curriculum

A. Free Elective

B. This course meets a program requirement for the A.A.S. Environmental Control Technology Program, and the Environmental Control Technology Certificate.

C. Course transferability: a) for New Jersey schools go to the NJ Transfer website, www.njtransfer.org; b) For all other colleges and universities go to their individual sites.

V. Outline of Course Content

A. Electrical Safety
B. Basic Electricity (electron theory, electricity & magnetism, AC & DC concepts)
C. Electric Circuits (series, parallel, combination – Ohms’/Watt’s laws)
D. Electric Meters, types and applications
E. Components, Symbols, and Circuitry of Air-Conditioning Wiring Diagrams
F. Wire & Fuse Sizing
G. Reading Schematic Diagrams
H. Alternating Current, Power Distribution, and Voltage Systems
J. Contactors, Relays, and Overloads; Control circuit transformers

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes
At the completion of this course, students will be able to:

1. Identify appropriate techniques to troubleshoot and solve problems related to the use of electricity in equipment (GE - NJ 4).
2. Apply quantitative reasoning to identify and solve issues with the use of electricity in equipment (GE - NJ 2).

**B. Course Learning Outcomes**

At the completion of this course, students will be able to:

1. Solve basic circuit problems applying Ohm’s, Watt’s and Kirchoff’s Laws.
2. Explain the factors considered when sizing an electrical circuit conductor.
3. Describe available types and sizes of enclosures and switch-disconnects/circuit-breakers.

**C. Assessment Instruments**

The following assessment methods may be used:

1. Projects.
2. Exams.
3. Lab Performance.
4. Demonstrations.

**VII. Grade Determinants**

A. Lab performance.
B. Exams.
C. Class participation.
D. Projects.

Modes of Teaching and Learning used in the Course:

A. Lecture/discussion.
B. Small-group work.
C. Laboratory work.
D. Student collaboration.

**VIII. Text and Materials**

Suggested Text: Electricity for Refrigeration, Heating and Air Conditioning


Please note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

**IX. Resources**

A. Reference books/manuals
B. Safety equipment
C. Sample electrical system components
D. Instructional videos/DVDs
E. Various environmental controls technology-shop tools and testers available in the lab.

X. Honors Option
   Not applicable