

for the purpose of energy conservation, via techniques such as thermostat programming, outdoor setback, staging and modulation of equipment components.

III. Statement of Course Need

- A. Technicians in the Environmental Control Technology field are vital to maintaining physical comfort within our residences. Understanding the controls and instrumentation utilized in typical comfort control systems 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 advanced electrical troubleshooting procedures and best-practices followed by professionals in the residential HVAC Controls 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. Temperature Sensing and Thermostats
- B. Controls for Gas Fired Heating
- C. Gas Burner Ignition Controls
- D. Controls for Oil Fired Heating
- E. Warm Air Controls
- F. Energy Conservation Controls
- G. Central Air Conditioning Controls
- H. Residential Air Quality Systems
- I. Supplemental (Peripheral) Controls and Accessories

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes

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

1. Identify appropriate techniques to solve problems specific to controls and instrumentation used with comfort control systems (GE - NJ 4).
2. Apply quantitative reasoning to issues related to controls and instrumentation utilized with comfort control systems (GE - NJ 2).

B. Course Learning Outcomes

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

1. Discuss the variables that affect human comfort
2. Apply understanding of thermostat performance in order to select the most effective thermostat for any equipment and the desired control logic combination
3. Identify the main elements necessary for various forms of combustion and heat pump operation
4. Explain what elements are required to ensure good indoor air quality

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: Honeywell Service Data Manual, Latest Edition, by Honeywell, Inc.

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
- B. Safety equipment

- C. Sample comfort control system components
- D. Instructional videos/DVDs
- E. Various environmental controls technology-shop tools and testers available in the lab.

X. Honors Option

Not applicable