

RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

ECTC 104 – Electricity for Environmental Control Technology II

I. Basic Course Information

- A. Course Number and Title: ECTC 104 – Electricity for Environmental Control Technology II
- B. New or Modified: Modified
- C. Date of Proposal: Fall 2016
- D. Effective Term: Fall 2017
- E. Sponsoring Departments: Business and Public Service Department
- F. Semester Credit Hours: 2
- G. Weekly Contact Hours: 3 Lecture: 1
 Laboratory: 2
 Out of class work per week: 2 hours
- H. Prerequisite: ECTC 103 – Electricity for Environmental Control Technology I
- I. Laboratory Fees: Yes
- J. Name and Telephone Number or e-mail Address of Department Chair:
Anne Marie Anderson, AnneMarie.Anderson@raritanval.edu

II. Catalog Description

Prerequisite: ECTC 103 – Electricity for Environmental Control Technology I.
This course exposes the student to a variety of controls which are part of refrigeration and air-conditioning systems; its aim is to develop a working knowledge of schematics and wiring diagrams. Course instruction seeks to build understanding of such controls as the student integrates them into fully-operational electrical circuits. This course fosters knowledge of refrigeration and air-conditioning circuits by assembling groups of controls in simulators and actual equipment. The student will get to see first-hand the operation of motor starters, refrigeration and air conditioning equipment ranging in size from the small window mounted unit to the more complex home and office central air conditioning systems.

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. Thermostats, Pressure Switches, and Other Electric Control Devices
- B. Residential Air Conditioning Control Systems
- C. Basic Electric Motors
- D. Components of Electric Motors
- E. Troubleshooting Electric Control Devices
- F. Troubleshooting Modern HVAC Control Circuitry and Systems
- G. Introduction to Commercial and Industrial Air-Conditioning Control Systems

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 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 the course, students will be able to:

1. Explain the operation of electromagnetic loads and select proper loads for environmental control applications
2. Explain the operation of control devices used in refrigeration circuits
3. Explain the operation of Start-Stop switches
4. Build working models of motor starters

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
Latest Edition, by Russell Smith, Delmar Cengage Learning.

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