RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

ECTC 103 - Electricity for Environmental Control Technology I

I. Basic Course Information

A. Course Number and Title: ECTC 103 – Electricity for Environmental Control Technology I

B. New or Modified Course: Modified

NEW

C. Date of Proposal: Fall 2022

D. Effective Term: Spring 2023

E. Sponsoring Departments: Business and Public Service

F. Semester Credit Hours: 2

G. Weekly Contact Hours: 3
Lecture: 1
Laboratory: 2
Out of class work per week: 3 hours

H. ☐ Prerequisite (s): None
☐ Corequisite (s): None
☒ Prerequisite (s) and Corequisite (s): None

I. Additional Fees: Laboratory Fees

J. Name and e-mail Address of
Department Chair: Tracy Rimple, Tracy.Rimple@raritanval.edu
Divisional Dean: Patrice Marks, Patrice.Marks@raritanval.edu

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
I. Contactors, Relays, and Overloads

VI. Course Learning Outcomes

A. <u>Outcomes</u>
At the completion of this course, students will be able to:

1. Solve basic circuit problems applying Ohm's and Watt's Laws (GE-2).
2. Show dexterity in the use of multimeters
3. Troubleshoot electrical components such as, but not limited to switches, contactors, relays, transformers.

B. <u>Assessment Instruments</u>

The following assessment methods may be used:

1. Lab. projects.
2. Exams.
3. Homework.

VII. Grade Determinants

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

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.

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