RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

CEMT 201 – Energy Management & Auditing I

I. Basic Course Information

A. Course Number and Title: CEMT 201 – Energy Management &Auditing I

B. New or Modified: Modified

C. Date of Proposal: Fall 2017

D. Effective Term: Fall 2018

E. Sponsoring Departments: Business and Public Service Department

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 6 — Lecture: 3; Laboratory: 3; Out of class work per week: 7.5 hours

H. Prerequisites/Corequisites: ECTC 102 – Air Conditioning Systems Design; ECTC 202 – Heating Systems Design

I. Laboratory Fees: Yes

J. Name and Telephone Number or e-mail Address of Department Chair and Divisional Dean at time of approval: Anne Marie Anderson, AnneMarie.Anderson@raritanval.edu, Terence Lynn, Terence.Lynn@raritanval.edu

II. Catalog Description

Prerequisites: ECTC 102 – Air Conditioning Systems Design; ECTC 202 – Heating Systems Design.
This is an entry-level course for students in the Commercial Energy Management Technology field. Responsible use of our Energy Resources is important in many respects, not the least of which is that much of it is not renewable. We as a society need to be conscientious about this fact and be good stewards of our resources so future generations are able to enjoy living on a planet that can support them and their offspring. Optimizing energy consumption in homes and buildings is also important to reduce carbon emissions and the financial burden which is the cost of operating these structures, thus increasing profitability. Saving energy makes financial sense. People who are knowledgeable about ways to save energy are a valuable and limited commodity.

This course covers an introduction to utility bill analysis, learning about common energy conservation measures, conducting walk-through level-1 energy audits, determining energy use of specific equipment, breaking out where all the energy in a structure is used, calculating energy savings, prioritizing energy saving measures, and pulling all this information into a simple report: The Energy Audit Report.

III. Statement of Course Need

A. Technicians in the Commercial Energy Management Technology field have very important roles to play in society. This course is vital for all students wanting to become an energy manager, facility manager, operations and/or maintenance manager, energy auditor, maintenance supervisor, superintendent of building and grounds, building/plant manager, maintenance director, or energy technician.

B. Extensive hands-on work in the form of computer-based and field-related activities is necessary to familiarize students with Auditing Procedures that will facilitate optimal management of energy consumption. Lab activities include, but are not limited to: home walk-throughs, building walk-throughs, lighting audits, lumen-output inspections, HVAC equipment operating performance data collection, electrical and mechanical equipment inspections for operating performance analysis and verification.

C. This course generally transfers as a free elective, but may transfer as a program elective to Pennsylvania College of Technology for those students graduating with the AAS in Commercial Energy Management 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. Commercial Energy Management Technology Program, and the Commercial Energy Management 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. Energy Audits and Retrofits
B. Codes, Standards and Guidelines
C. Benchmarks and Audit Safety
D. Residential Energy Systems
E. Residential Energy Auditing
F. Residential Audit Evaluation
G. Commercial and Industrial Energy Systems

H. Commercial and Industrial Energy Auditing
I. Commercial and Industrial Retrofit Modeling

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes

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

1. Acquire and analyze utility data from customers and utility representatives (GE - IL).
2. Perform Energy Saving Calculations for common Energy Conservation Measures (GE - NJ 2).

B. Course Learning Outcomes

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

1. Describe the various aspects of an energy audit.
2. Conduct a utility bill analysis.
3. Analyze graphs or trends showing energy consumption.
4. Prepare Level-1 Energy Audit Reports.

C. Assessment Instruments

The following assessment methods may be used:

1. Projects. (Required)
2. Exams.
3. Lab Performance.
4. Demonstrations.

VII. Grade Determinants

A. Lab performance.
B. Exams.
C. Class participation.
D. Projects. (Required)

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: Energy Auditing Practices, Latest Edition, by American Technical Publishers
ISBN 978-0-8269-0690-8

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. Testers used for HVAC troubleshooting
D. Campus facilities used as a living lab
E. Instructional videos/DVDs
F. Various energy auditing tools and testers available in the lab

X. Honors Option

Not applicable