RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

CEMT 202 – Energy Management & Auditing II

I. Basic Course Information

A. Course Number and Title: CEMT 202 – Energy Management &Auditing II

B. New or Modified: New

C. Date of Proposal: Fall 2016

D. Effective Term: Fall 2017

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: 6 hours

H. Prerequisite: CEMT 201 – Energy Management & Auditing 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

Pre-requisite: CEMT-201 – Energy Management & Auditing I. This is a course for students in the Commercial Energy Management Technology field that builds upon the basic concepts learned in CEMT-201 and continues with a more detailed examination of building energy

systems, including a detailed analysis of its various components such as Building Envelope, Lighting, HVAC, Domestic Hot Water, Plug Loads, and Compressed Air and Process Uses. A necessary next step will then take the student into detailed energy analyses of energy consumption that aim at quantifying base loads, seasonal variation, and efficient energy costs; and from there to the study and assessment of lighting, air quality, temperature, ventilation, and other conditions affecting performance and human comfort. Computer simulation will be introduced to estimate changes in energy usage resulting from potential optimization that ensues from the implementation of a number of Energy Conservation Measures (ECMs).

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 energy managers, facility managers, operations and/or maintenance managers, energy auditors, maintenance supervisors, superintendents of building and grounds, building/plant managers, maintenance directors, or energy technicians.

B. Extensive hands-on work in the form of computer-based and field-related activities is necessary to advance the student's knowledge with Level-2 Auditing Procedures that will facilitate optimal management of energy consumption and help determine the most optimal portfolio of Energy Conservation Opportunities (ECOs). Lab activities include, but are not limited to: use of duct-blaster, blower-door, thermal imagers, building energy consumption simulation software, HVAC equipment performance ratings, Lighting Surveys, Electrical Consumption Analysis, Water Audits and Building Walk-throughs.

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. Overview of the three types of ASHRAE Energy Audit Levels
B. Strategies for building the Audit Implementation Team
C. Preliminary Energy Use Analysis

D. The Site Visit
E. Measurement of Building Operational Characteristics and Operating Conditions
F. Types of Energy Efficiency Measures
G. Energy Calculations and Analysis of proposed ECM Portfolios
H. Economic Evaluation
I. Generating the Audit Report
J. The Follow-up Meeting and Implementation of the recommended measures

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes

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

1. Explain the components of a Level-2 ASHRAE Audit (GE - NJ 1).
2. Perform computerized Energy Audit Simulations (GE - NJ 2).

B. Course Learning Outcomes

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

1. Describe the various aspects of Level-2 energy audits.
2. Conduct an energy use analysis.
3. Use proficiently Energy Audit Preparation Software.
4. Prepare Level-2 Energy Audit Reports.

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: Procedures for Commercial Building Energy Audits, Latest Edition,
by ASHRAE ISBN 978-1-936594-09-1

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. Instruments used for Energy Analysis
E. Campus facilities used as a living lab
F. Instructional videos/DVDs
G. Various energy auditing software, tools and testers available in the lab

X. Honors Option

Not applicable