

# Energy Auditing Technician-Residential Certificate

This course of study is to prepare students to perform residential energy audits. An energy audit will help customers make decisions about how to conserve energy and save money on utility bills. Customers will also benefit from an increase of comfort, health, safety, and the durability of their homes. The audit involves a visual inspection of the residence, a series of diagnostic tests, and a numerical analysis by means of a software package. Auditors inspect, measure, and test to decide what energy-saving retrofits are practical and cost-effective. An energy audit is also called a home energy analysis, a home performance analysis or an energy survey.

## Suggested/Sample Course Sequence

The sequence taken by the student may vary depending on prerequisites, course availability, and personal/ professional responsibilities.

(Major Code 4300; State CIP Code 15.0503)

- Energy Performance (<http://www.jccc.edu/energyauditor>)

### First Semester

EPRM 120	Introduction to Residential Energy	3
EPRM 123	Active & Passive Residential Systems*	4
CET 105	Construction Methods	3
Total Hours		10

### Second Semester

DRAF 129	Interpreting Architectural Drawings	2
CET 150	Construction Safety	3
EPRM 127	Residential Energy Data Collection and Input*	3
INDT 155	Workplace Skills	1
EPRM 130	Residential Energy Auditing Application*	3
Total Hours		12

**Total Program Hours: 22**

## Courses

### EPRM 120 Introduction to Residential Energy\* (3 Hours)

**Prerequisites or corequisites:** RDG 126 or College Reading Readiness

Upon successful completion of this course, the student should be able to evaluate energy usage of the past and the future, describe the energy picture of today's world, identify the priorities for energy efficiency, and describe the purpose of a residential energy audit. Competencies will include knowing energy and the laws of thermodynamics; heat transfer through building envelope; sources of internal heat gain and heat loss calculations; energy transformation and heat flow; efficiency of HVAC systems, water heating systems, and appliances; and basic electrical wiring, lighting, and components of a residence. 3 hrs. lecture/wk.

### EPRM 123 Active Passive Residential Systems\* (4 Hours)

**Prerequisites:** EPRM 120 or department approval

This is a course to explain how active and passive systems work together in a residence, and to discuss the energy efficiency of each system. Upon successful completion of this course, the student will be able to identify the components of the building shell and their relationship to air-conditioning systems, heating systems, hot water heating, lighting, appliances, occupants, and the electrical or gas systems that supply energy. Topics will include heat laws, refrigeration cycle, electrical theory, various types of furnaces, air conditioners, hot water heaters, lighting, windows and doors, and various types of controls. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment.

### EPRM 127 Residential Energy Data Collection and Input\* (3 Hours)

**Prerequisites:** ERPM 123

Upon successful completion of this course, the student will be able to identify techniques and procedures used in the residential construction industry to determine the construction details of the residence, the size and type of HVAC equipment, and other appliances as it relates to a residential energy audit. The student will be required to complete field data collection forms and record detailed information of the components of a residence. This data will be entered into various computer modeling programs. The output from the software will help determine what recommendations should be made to the homeowner to improve the energy efficiency of their residence. 2 hrs. lecture, 2 hrs instructional lab.

**EPRM 130 Residential Energy Auditing Application\* (3 Hours)**

**Prerequisites or corequisites:** EPRM 127

This course outlines a complete energy audit procedure that will ensure consistent data collection for a residence. Topics include diagnostic procedures to evaluate the building shell, doors and windows, air leakage, and other residential energy inefficiencies. The course includes recommendations the auditor can make to increase the energy efficiency and functionality of a client's home based on the audit. Analysis of residential heating and cooling systems and appliances, as well as performing a combustion appliance zone test is included in the course. A major focus of the course is the use of appropriate test equipment, such as a blower door, duct blaster, and other hand-held evaluation and measuring devices necessary to conduct effective energy audits. Information from the audit will be entered into modeling software to determine energy efficiency measures for the residence being audited. Students will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 1 hr. lecture, 3 hrs instructional lab/wk.

**EPRM 142 Solar Thermal Systems\* (3 Hours)**

**Prerequisites or corequisites:** RDG 126 or College Reading Readiness

Solar Thermal Systems presents the key components of thermal conversion systems to absorb and use heat from sunlight. Solar module types and properties, balance of system components, energy management, and economics for a variety of solar thermal system applications are studied. The course includes details of design, installation, operation, and evaluation of solar thermal systems. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level Solar Thermal exam. 4 hours of integrated lecture lab/wk.

**EPRM 252 Solar Electric Systems\* (3 Hours)**

**Prerequisites:** ELTE 125 or ELTE 200

Solar Electric Systems presents the key components of photovoltaic (PV) conversion systems to produce electricity from sunlight. Solar module types and properties, balance of system components, stand-alone and utility interface, energy management, and economics for a variety of PV applications are studied. The course includes details of design, installation, operation, and evaluation of photovoltaic systems. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level PV exam. 3 hrs. lecture/wk.

**EPRM 256 Solar Electric Systems Lab\* (1 Hour)**

**Prerequisites or corequisites:** EPRM 252

Solar Electric Systems Lab presents practice in the use of the key components of photovoltaic (PV) conversion systems to produce electricity from sunlight. Solar module types and properties, balance of system components, stand-alone and utility interface PV applications are installed. The course includes hands-on details of design, installation, and operation. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level PV exam. 2 hrs. instructional lab/wk.