



THERMAL COURSE

COURSE OVERVIEW

This course is intended for individuals looking to become energy auditors or for auditors presently working on building heating systems in the Con Edison Small-Medium Business (SMB) Program and other small commercial energy efficiency programs. This course is also intended for individuals looking for a program management role in the SMB or other small commercial energy efficiency programs. This course is designed to provide building heating system knowledge and skills to auditors to increase the adoption of energy measures by small commercial customers and cover basic technologies as well as additional technologies that may not be part of a standard audit. Emphasis is placed on the auditor's ability to recognize the customer's building heating systems energy needs, opportunities, and how these opportunities may relate to other key aspects of the business. All Building Heating Systems Course curriculum is directly aligned with the Building Performance Institute's (BPI's) Building Analyst (BA) and Multifamily Building Analyst (MFBA) certifications. For individuals seeking project management positions this course provides a grounded foundation in building heating s knowledge and covers the economic landscape to navigate career paths in the industry.

COURSE OBJECTIVES

The objective of this course is to improve performance of building heating system energy efficiency programs serving the small commercial market segment. The energy auditor is seen as a key catalyst in the decision-making process of the small commercial customer. Accordingly, the training program seeks to strengthen auditor skills so they may assist customers with what have become standard technology upgrades (e.g., heating systems and domestic hot water systems), as well as more advanced technologies.

COURSE STRUCTURE

- The course consists of 20 class sessions, for a total of 60 hours of classroom instruction.
- To successfully complete the training, students must meet attendance requirements, complete projects, and pass a final exam.
- Online readings will also be assigned on an optional/as-needed basis.

INSTRUCTIONAL TEAM

Clayton Gregory *Training Manager*

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Antuan Cannon *EE Instructor*

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Alejandro Alvarez *EE Instructor*

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Gary Smith *EE Instructor*

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Melika Wadany *Instructor Assistant*

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Omar Duran *Tech Support*

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ATTENDANCE

- Attendance will count for 25% of the total grade
- Each day will be split into two (2) three-hour blocks:
 - 11:30am – 2:30pm: Morning Block
 - 3:30pm – 6:30pm: Afternoon Block
- Limited absences are allowed as follows:
 - A maximum of two (2) unexcused block absences is permitted (equaling one (1) day)
 - A maximum of four (4) excused block absences is permitted (equaling two (2) days)
 - Reserve excused absences for emergencies only

GRADING

- Grading Breakdown:











■ Attendance	25%	■ Practice Activity	25%
■ Review Quizzes	25%	■ Final Exam	25%
- Students who attend all classes, complete and submit the audit report project, and pass the final exam, will receive a "Certificate of Completion" from the Willdan Clean Energy Academy.
- A grade of 75% is required to pass the final exam.
- Review and Final Exam will be held on the Monday after the second week of class.
- Final Exam grades will be given immediately after exam submission

COURSE STRUCTURE











<p>Class 1</p> <p> Green Economy I</p> <ul style="list-style-type: none"> Green Economy Intro Sustainability Sector & Industries 	<p>Class 2</p> <p> Green Economy II</p> <ul style="list-style-type: none"> NY Green Economy Players Green Economy Market Drivers 	<p>Class 3</p> <p> Building Envelope I</p> <ul style="list-style-type: none"> Energy Principles Building Science 	<p>Class 4</p> <p> Building Envelope II</p> <ul style="list-style-type: none"> Construction Process
<p>Class 5</p> <p> Building Envelope III</p> <ul style="list-style-type: none"> Air Movement 	<p>Class 6</p> <p> Building Envelope IV</p> <ul style="list-style-type: none"> Moisture Movement 	<p>Class 7</p> <p> Building Envelope V</p> <ul style="list-style-type: none"> Heat Movement 	<p>Class 8</p> <p> Domestic Hot Water I</p> <ul style="list-style-type: none"> DHW Principles Combustions Science 1 Heat Sources 1
<p>Class 9</p> <p> Domestic Hot Water II</p> <ul style="list-style-type: none"> DHW Systems 	<p>Class 10</p> <p> Domestic Hot Water III</p> <ul style="list-style-type: none"> DHW Energy Conservation Measures 	<p>Class 11</p> <p> Green Economy III</p> <ul style="list-style-type: none"> City Policies + Programs State Policies + Programs 	<p>Class 12</p> <p> Heating Systems I</p> <ul style="list-style-type: none"> Heating Principles Combustion Science 2 Heat Sources 2
<p>Class 13</p> <p> Heating Systems II</p> <ul style="list-style-type: none"> Heating Systems 1 (Steam) 	<p>Class 14</p> <p> Heating Systems III</p> <ul style="list-style-type: none"> Heating Systems 2 (Hot Water) 	<p>Class 15</p> <p> Heating Systems IV</p> <ul style="list-style-type: none"> Heating Energy Conservation Measures 	<p>Class 16</p> <p> Heating Systems V</p> <ul style="list-style-type: none"> Program Implementation
<p>Class 17</p> <p> Heating Systems VI</p> <ul style="list-style-type: none"> Standards & Codes 	<p>Class 18</p> <p> Heating Systems VII</p> <ul style="list-style-type: none"> Combustion Safety Testing 	<p>Class 19</p> <p> Energy Modeling I</p> <ul style="list-style-type: none"> Energy Modeling Software 1 	<p>Class 20</p> <p> Energy Modeling II</p> <ul style="list-style-type: none"> Energy Modeling Software 2

CLASS SCHEDULE BREAKDOWN

WEEK 1 (JAN 11 - 15)

	MON	TUE	WED	THU	FRI
11:30am - 2:30pm	 Green Economy I	 Building Envelope I	 Building Envelope III	 Building Envelope V	 Domestic Hot Water II
2:30pm - 3:30pm	Break				
3:30pm - 6:30pm	 Green Economy II	 Building Envelope II	 Building Envelope IV	 Domestic Hot Water I	 Domestic Hot Water III

WEEK 2 (JAN 18* - 22)

	MON	TUE	WED	THU	FRI
11:30am - 2:30pm	 Heating Systems I	 Heating Systems III	 Heating Systems V	 Heating Systems VII	 Energy Modeling I
2:30pm - 3:30pm	Break				
3:30pm - 6:30pm	 Heating Systems II	 Heating Systems IV	 Heating Systems VI	 Heating Systems VIII	 Energy Modeling II

* No classes in observance of Dr. Martin Luther King Jr. Day. All scheduled classes and exams will shift to the next day.

AT THE END OF THIS COURSE, STUDENTS WILL:

- Be familiar with the industry-standard energy auditing and building performance analysis process: including building inspection data collection, input equipment diagnostics, equipment use, cost and efficiency calculations, and audit report generation
- Be able to perform ASHRAE Level 1 and Level 2 energy audits for small commercial facilities
- Be proficient in the use of Con Edison Small-Medium Business (SMB) Excel tool software, Excel-based utility billing analysis, and energy benchmarking using energy modeling software.
- Have built sales and marketing, financial analysis, and project management skills along with energy auditing proficiency.
- Be versed on relevant economic incentives: including utility-administered programs such as Con Edison’s SMB, Commercial & Industrial (C&I), and Targeted Demand Management (TDM), and government-administered programs such as NYSEERDA’s FlexTech, Existing Facilities and Green Jobs-Green New York (GJGNY) ; and understand the connection between these incentive programs and career opportunities, specifically in commercial heating sales, auditing, and retrofitting.
- Be able to Identify energy systems, including heating and building science, specifically the system types and components, efficiency ratings, and conservation measures
- Be familiar with energy efficiency strategies including improved controls, operations and maintenance, retro-commissioning, retrofits and upgrades, and reduced consumption.