



Energy Management Institute

Course Catalog 2022

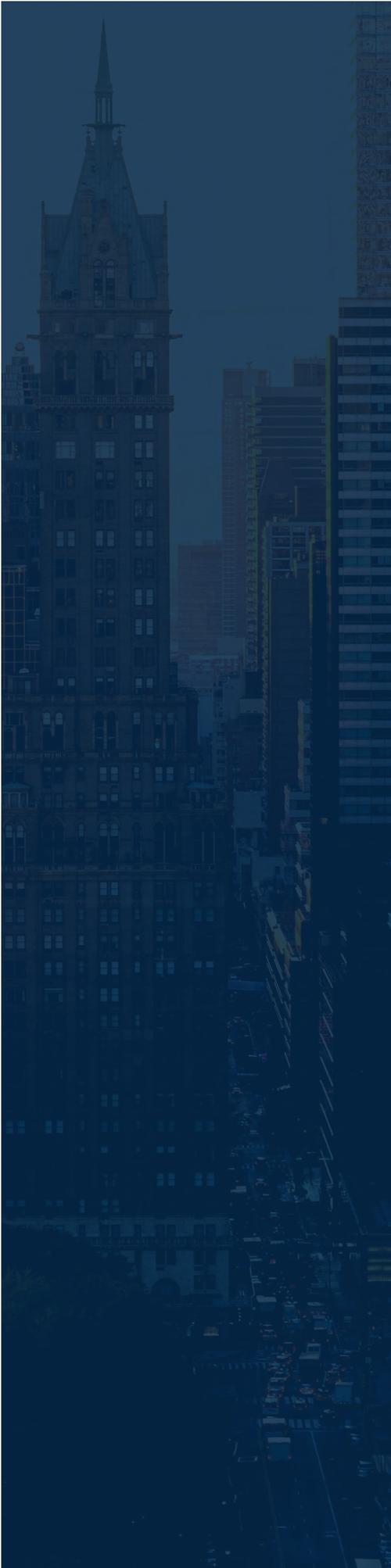
Energy

NYC DCAS
Citywide Administrative Services

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A Message from Our Team

Welcome to the Energy Management Institute (EMI)!

Our EMI team is proud to continue providing energy training to the City of New York's workforce to enable them to meet New York City's emissions reduction and energy objectives.

In the last year, we have seen increased drive and commitment among City agency personnel in the pursuit of their learning and professional development, which has been inspiring to our staff, subject matter experts and instructors. With the goal of continuing to make diverse, relevant and interesting courses available to City employees, this year, we are adding new courses from the North American Passive House Network and ASHRAE Learning Institute to our portfolio.

To ensure that you have continuous access to energy management training and certification opportunities, some of **EMI's Winter / Spring 2022 courses will be delivered using a virtual classroom format** and some courses this year may be delivered with a hybrid approach (instructor-led in person and remote). In order to enhance a student-centered virtual learning experience, we focused on:

- Incorporating more opportunities for real-life examples (e.g., livestreaming for onsite demonstrations);
- Preparing our team to expertly manage and improve the online learning platform;
- Working to ensure that learners have the resources, both in terms of technology capability and additional instructor support, to succeed in their learning.

Our team will continue to follow the City of New York, City University of New York, and the New York State's guidance on reopening for in-person classes and refine our approach accordingly.

Until we can reunite in the classroom, we look forward to seeing you in virtual training!

For more information about CUNY's response to the coronavirus disease, go to www.cuny.edu/coronavirus. For NYC updates and other helpful information, visit www.nyc.gov/coronavirus.

Best,
The EMI Team

City University of New York, School of Professional Studies
Department of Citywide Administrative Services, Division of Energy Management

About the EMI Program

The Energy Management Institute (EMI) is a training program offered by the Department of Citywide Administrative Services' (DCAS) Division of Energy Management (DEM) in collaboration with the City University of New York's School of Professional Studies (SPS), CUNY Building Performance Lab (BPL), and the City's Citywide Training Center (CTC).

New York City has ambitious climate mitigation goals, and aggressive reduction of greenhouse gas emissions is a key strategy. Since energy use in buildings is a major source of emissions, building and energy management staff have a critical role in reducing energy. Through training, EMI helps empower City staff to make energy-smart decisions, implement operational improvements, and advocate for energy retrofits and clean energy projects across the City's portfolio.

Today, through EMI, DEM offers a diverse set of courses that provide targeted competency-based training and integrate national certification requirements. The courses are led by experienced practitioners in the field. They are open to all City staff free of charge.

Who should take EMI courses?

While many EMI courses are geared towards building operators and facilities management staff, there are offerings suitable for all staff involved in energy management in City buildings.

How do I know which EMI course is right for me?

Staff can also select the courses that are right for them based on the following factors: breadth of topics covered as it relates to their job responsibilities, certifications required, level of in-going expertise, and time commitment to course. Please see the [Learning Paths](#) section on page 41.

What is a typical virtual EMI session experience like?

EMI courses range in length from half-day workshops to months-long courses. Depending on

the course, there may be up to 20 students per class. EMI's virtual sessions are instructor-led, and students participate using virtual training technology (Zoom). Most sessions will still take the same amount of time as an in-person training, and sessions will still have the same expectations on project deadlines, exams, and class participation, such that the program complies with third-party certification requirements.

What do City staff need to do to participate in an EMI course?

To participate, potential students should complete the following five steps:

- **Enroll:** To enroll in an EMI course, potential students should first seek and receive permission to participate in the course from their direct supervisor(s). They should [then register online](#) or complete the EMI Registration Form and email it to EMItraining@sps.cuny.edu by the course's designated registration date.
- **Participate:** Students should attend sessions, complete online modules and exams, if applicable, and do required assignments and projects. For tips on how to successfully participate in a virtual session, go to page 8.
- **Provide feedback:** Students should complete in-session and post-session evaluations to provide feedback on their experience. EMI uses this information to improve the course for future students.
- **Take any necessary certification exams:** CUNY SPS helps City staff complete their paperwork to take certification exams and receive credentials. Generally, we provide one-time funding for City staff to take EMI-sponsored credential exams.
- **Apply lessons learned:** Students are expected to work towards implementing the energy management best practices that they have learned at their agencies.

What is the time commitment for the courses?

Some EMI courses are multi-day, while others are a single day or less. Each EMI course has different requirements for time spent in class for instructor-led learning and outside of class to conduct research, develop projects, complete online learning modules or reading assignments, and prepare for exams. The **Time Commitment to Course (TCC)**, which considers time spent in class and outside of class (for projects and self-study), as well as the duration of the course itself, can be classified as **Low, Medium or High**:

Low | up to seven hours a week, or, courses that only run for one day

Medium | up to 10 hours a week, or, courses that only run for one week

High | up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study

When are EMI courses offered?

EMI courses are offered according to a fall and spring semester schedule and take place during standard working hours. In addition, DEM offers select courses during Learning Fairs.

How can I register online?

EMI accepts online applications for courses via the [online registration portal](#). Click the “Register Now” button on the homepage of the portal to begin the registration process. Guidelines on how to register are outlined in more detail on pages 47 and 48.

What other important information about EMI do I need to know?

Registration Guidelines

City employees should refer to their agency’s training guidelines and must obtain their supervisor’s (and, depending on their agency, their training liaison’s and HR department’s) approval before participating in EMI courses. See pages 46 and 47 for the complete EMI registration guidelines.

Course Enrollment Cancellation Policy

If a City employee registers for an EMI course but drops out before satisfactory course completion, a “No Show” fee will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy. The specific cancellation fee for

each course is listed under the course description. CUNY SPS must receive requests to cancel enrollment without a fee in writing at least seven business days before the confirmed start date for the course. Agencies may designate a qualified participant for substitution up to the commencement of the class without penalty.

Course Attendance Policy

City employees participating in an EMI course are expected to attend all scheduled sessions and arrive by the scheduled start time. **Excessive lateness or absences will result in the employee being dropped from the course and their agency being assessed a “No Show” fee.** In the event of an emergency, illness, or other unforeseen circumstances which would prevent you from attending a session or taking a scheduled exam, course participants are expected to contact their course instructor and the program manager assigned to your course about your absence and make any necessary arrangements to complete missed assignments/exams prior to the next class.

Course Academic Integrity Policy

CUNY SPS and DEM are committed to upholding CUNY’s Academic Integrity Policy. To this end, students are expected to submit assignments that reflect their own individual efforts and to seek support directly from the course instructor when they encounter challenges with the course requirements. Students who submit work that has been copied from other students or sources will be penalized and withdrawn from the course. Unless otherwise indicated by the course instructor, group projects will not be accepted. For more information, please visit: http://sps.cuny.edu/acad_policies/acad_integrity.html.

Accessing EMI Online Materials

Students can access online instructional materials through a dedicated portal, the Hughes Learning Management System (LMS), at <https://boc1.rapidtraining.com/login>. Students will receive specific information about the process for logging into the LMS once they are enrolled in a course.

What are the Learning Fairs?

During the Learning Fairs, DEM and CUNY SPS offer half-day courses over a concentrated two - to three-day period. Learning Fairs are designed to serve both (1) City staff who hold either BOC-1 or BOC-2 credentials and want to maintain their active credentials and (2) City staff who seek to expand



their energy management knowledge in specific areas, but do not necessarily have those credentials.

Can City staff contribute to EMI course development?

Yes! DEM, CUNY SPS, and other partners work together to update courses to include the newest developments and technologies. We always are looking for subject matter experts (SMEs) to contribute to course development. If you are interested in supporting EMI as a SME, please contact the [Program Manager](#).

Are EMI courses the only energy-related training that DEM provides?

No! In addition to the training opportunities offered through EMI, DEM also offers three other energy management training options to City staff to support their professional development. In particular:

- **Customized energy management training available for agency staff using ExCEL funding:** City agencies can apply for competitive expense funding to offer specialized energy-related training to their staff through the ExCEL Program. Previously, DEM has focused on funding manufacturer-specific, hands-on training through ExCEL, as distinct from the broader overview training provided through EMI. Generally, DEM-funded Agency Energy Personnel lead the preparation of proposals for ExCEL-funded training.
- **In-house training directly offered by DEM:** DEM also directly provides select training in-house on specific topics core to our work. DEM continues to work on refining the set of in-house training that we offer. However, we generally provide EC3 and EnerTrac training on a quarterly basis.
- **Energy-related training videos:** In addition, DEM has worked with CUNY SPS to develop a range of energy-related training videos for City

staff. The full collection of training videos is available through the [DEM Videos website](#). If you have questions about ExCEL-funded, in-house, or video training opportunities, please contact the [Program Manager](#).

Who can I contact if I have further questions?

DEM EMI Team

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CUNY SPS EMI Team

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Vitoria Balduci-Hyams, Program Coordinator

Ensuring a Successful Virtual Learning Experience

You should expect quality learning delivered by subject matter experts and experienced instructors, however, you should also expect to assume responsibility for your own learning.

EMI's virtual classroom setting is similar to a traditional classroom environment, in that most sessions are instructor-led, and everyone participates live at the same time using virtual training platforms. Most sessions will still take the same amount of time as an in-person training, and sessions will still have the same expectations on project deadlines, exams, and class participation, such that the program complies with third-party certification requirements.

Video Participation



Video participation is required during EMI's virtual sessions in order to promote interaction and engagement with your instructors and classmates, as well as the course topics. To participate in EMI courses, **participants must have a working built-in camera or webcam.** Mobile devices/tablets do not have the necessary features for participation in the course activities and are not permitted.

Minimum Requirements for Zoom

Supported Operating Systems:

- Windows 7 or newer version;
- macOS X with macOS 10.9 or later;
- Other supported Operating Systems.

Supported Browsers:

- Windows: Internet Explorer 11+, Edge 12+, Firefox 27+, Chrome 30+;
- macOS: Safari 7+, Firefox 27+, Chrome 30+;
- Linux: Firefox 27+, Chrome 30+;
- Other supported browsers.

For more information about Zoom's Minimum Technology Requirements, please visit the [System Requirements for Zoom](#) page.

Before the session

- **Test your equipment.** EMI courses have minimum technology requirements so participants can be successful in a course, which include: a computer or laptop, reliable internet connection, working camera and microphone.
- **Learn the technology.** EMI courses will be deployed through Zoom, and we encourage you to attend EMI-led Zoom orientation / walkthrough sessions to familiarize yourself with the platforms prior to the first class. Additional resources are:
 - [How To Join a Zoom Meeting](#)
 - [How to configure Zoom Audio/Video](#)
 - [How to use Zoom Meeting Controls](#)

During the session

- **Prioritize your learning.** Identify a conducive learning space in your home or work location, and as much as possible, refrain from working on other tasks during the class.
- **Participate and connect.** Use the Zoom platform features to engage with your instructors and fellow learners. All participants are highly encouraged to add to the discussion, as learners usually find value hearing their colleagues' real-world work experience.
- **Communicate if you experience technical issues,** have further questions, or encounter external concerns that impact your participation, please let the instructor and program manager know. We will work with you to troubleshoot or identify possible accommodations.

After the session

- **Share feedback.** Provide honest responses about your virtual training experience through surveys or course evaluations.
- **Continue learning.** Take advantage of virtual learning opportunities, such as other EMI courses, [DCAS Citywide Training Center](#) courses and external webinars and conferences.
- **Apply your new skills.** The City has just invested time and money on your training. We hope you are ready and confident to play your part in supporting the citywide energy reduction goals!

Winter / Spring 2022 Course Schedule

COURSES	TRAINING DATES
Building Operator Certification, Level 1	Cohort A: February 17, 24, March 3, 10, 17, 24, 31, April 7, 21, May 5, 19, and June 2 Cohort B (Dept. of Education staff only): February 16, March 2, 9, 16, 23, 30, April 6, 13, 27, May 11, 25 and June 8
ASHRAE Instructor-Led Virtual Courses	Energy Modeling Best Practices and Applications: March 29 and 30 High-Performance Building Design: Applications and Future Trends: April 5 Introduction to BACnet®: April 12 Improving Existing Building Operation: May 3, 4 and 5 Operations & Maintenance of High-Performance Buildings: June 14 and 15
Energy-Efficient Controls Systems	April 8, April 22, May 6, 10 (lab), 20 and June 3
Certified Energy Auditor (CEA)	April 25, 26, 27, 28 + self-scheduled exam
Introduction to Load Management	April 26
Load Management Training and Coaching	Cohort E (Dept. of Education staff only): May 4, 18, June 1, 15, 29, July 13, 27 and August 10 Cohort F: May 12, 26, June 9, 23, July 7, 21, August 4 and 18
Certified Energy Manager (CEM)	May 9, 10, 11, 12 + self scheduled exam
Fundamentals of Building Systems	May 10 and May 24
Certified Building Commissioning Professional (CBCP)	May 23, 24, 25, 26 + self-scheduled exam
Renewable Energy 101	June 7, 8, 9 and 10



Course Descriptions

Fundamentals of Building Systems



NYC energy and climate goals, principles of building systems



two weeks

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

Fundamentals is designed to provide foundational energy management knowledge for City staff. It provides an overview of critical building systems and equipment, including their relationship to energy consumption; explains electrical and mechanical engineering concepts pertinent to building operations; and introduces best practices for energy efficiency in City buildings. The course prepares students without a technical background to succeed in BOC-1.

Fundamentals consists of a half-day introductory session, followed by ten self-paced online modules, and then a half-day wrap-up session which closes out the online modules to ensure understanding. The online modules cover: (1) the building envelope; (2) the science of building systems; (3) HVAC, plumbing, and electrical building systems; (4) building controls; (5) occupant controls; (6) maintenance; (7) risks; (8) codes, zones, and regulatory requirements; (9) environmental factors; and (10) a wrap-up module. To successfully complete the course, students must attend the two online sessions; finish all self-paced modules; and take pre- and post- learning assessments given during the first and final classes. See the course

syllabus [here](#).

Target Audience

Fundamentals is designed for City energy management staff who are not building operators and do not have a technical background. Students enrolled in this course should not have primary job responsibility for managing building operations at their facility and/or extensive working knowledge of building systems and equipment. In most cases, Fundamentals is a pre-requisite for non-building operators who seek to complete BOC-1.

Learning Path

Fundamentals is mapped to the **foundational category** relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **LOW** (up to seven hours a week, or, courses that only run for one day).

Fundamentals of Building Systems

Semester(s)	Fall and Spring
Duration	Two sessions and one self paced lab over a span of two weeks
Day	Tuesdays
Time	9 AM to 1 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Fundamentals but drops out before satisfactory course completion, a “No Show” fee of \$975 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Building Operator Certification Level 1 (BOC-1)

 building systems, efficient operations, energy data

 four months

 third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

BOC-1 is the foundational energy efficiency course for building operators working in City facilities. It is designed to help building operators identify opportunities to make their facilities more energy efficient so they can contribute to meeting City energy and emissions reductions goals. BOC-1 provides an overview of building systems and equipment, including electrical systems, mechanical systems, lighting technologies, and building controls. It also introduces students to energy data management and analysis and operational improvements that can improve energy efficiency and occupant comfort.

BOC-1 consists of 12 sessions taught by subject matter experts over a four-month (18 weeks) period, complemented by 14 self-paced online modules. To successfully complete the course, students must attend all live online sessions and complete all online modules; take and pass four module-specific exams; and submit four practical project assignments focused on applying concepts learned in class to the facilities where they work. Students who do so can pursue the BOC-1 certification from the Northwest Energy Efficiency Council (NEEC). CUNY SPS and NEEC work together to assist City staff in completing

their paperwork for the credential and taking the certification exam. See the course syllabus [here](#).

Target Audience

BOC-1 is open to building operators, facilities management staff, and other energy management staff working in City buildings. The course is especially well-suited to the following:

- Building operators who may have limited formal building systems training, but have substantial on-the-job experience with building systems.
- Energy management staff who already have received some energy efficiency training and are seeking to deepen their understanding of building system and equipment concepts. In general, energy management staff should take the Fundamentals of Building Systems course before enrolling in BOC-1.
- In most cases, Fundamentals of Building Systems is a pre-requisite for non-building operators who seek to complete BOC-1.

Learning Path

BOC-1 is mapped to the **building operations** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **HIGH** (up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study).

BOC-1

Semester(s)	Fall and Spring
Duration	12 sessions over a span of four months
Day	Thursdays or Wednesdays
Time	9 AM to 4 PM or 8 AM to 3 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	High
Minimum Technology Requirements	Computer or Laptop (Required for DOE staff) Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at [bit.ly/EMI-Registration](#)*****

Cancellation Fee

If a City employee registers for BOC-1 but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Building Operator Certification Level 2 (BOC-2)



high-performance operations,
system calibration, troubleshooting



seven months



third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

BOC-2 offers advanced training to City staff who meet the enrollment pre-requisites and want to further their building energy management skills. BOC-2 is comprised of six core modules: (1) Best Practices for High-Performance Operations and Maintenance; (2) Sensors, Calibration, and Transmitters; (3) HVAC Controls Optimization; (4) Energy Strategies: Control Sequences of Operation; (5) Electrical Maintenance and Troubleshooting; and (6) Boiler Plant and Hydronic System High-Performance O&M.

BOC-2 consists of 22 synchronous online sessions taught by subject matter experts over a seven-month (30-week) period, complemented by 10 self-paced online modules. The course also includes activities guided by subject matter experts and learning coaches. To successfully complete the course, students must attend all sessions and complete all online modules; take and pass module-specific exams; and submit practical project assignments focused on applying concepts learned in class to the facilities where they work. Students who do so can pursue the BOC-2 certification from the Northwest Energy Efficiency Council (NEEC). CUNY SPS and NEEC work together to assist City staff in completing

their paperwork for the credential and for taking the certification exam. See the course syllabus [here](#).

Target Audience

BOC-2 is designed for students who have previous intensive energy management training or experience. Specifically, it is meant for students who have successfully completed BOC-1 and/or are Certified Building Operators (CBOs), Certified Energy Managers (CEMs), Certified Building Commissioning Professionals (CBCPs), or Certified Energy Auditors (CEAs). On a case-by-case basis, students may be able to substitute other advanced training or experience for these credentials; please reach out to CUNY SPS to request enrollment permission.

Learning Path

BOC-1 is mapped to the **building operations** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **HIGH** (up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study).

BOC-2

Semester(s)	Fall
Duration	22 sessions over a span of seven months
Day	Fridays
Time	9 AM to 4 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	High
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for BOC-2 but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Energy-Efficient Controls Systems



DDC and pneumatic controls, sensor calibration, trends analysis



six weeks

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

This instructor-led learning course provides an interactive opportunity for skilled tradespeople who work within agency buildings to discover, discuss, and analyze the effects of building controls systems on energy efficiency in municipal building operations within the City of New York. This course will give tradespeople the tools and strategies necessary to maintain and optimize building controls systems to maximize the energy efficiency of their buildings. At the conclusion of the controls course, participants will be able to use equipment to measure energy data and identify trends, describe how to use schedules for a DDC system, identify ways to optimize pneumatic controls, prove sensors are calibrated to ensure energy efficiency and indoor air quality, apply meters to Building automation systems to monitor real-time building energy efficiency, and communicate with information technology specialists about maintaining the BMS systems.

Energy-Efficient Controls Systems consists of five (5) online instructional sessions and one (1) virtual BMS tour and lab taught by subject matter experts over a six (6) week period. The course provides training on building controls components that affect energy consumption. The 6-day course follows a blended

learning format, with instructor-led online sessions, virtual tours, and other learning modalities (i.e. videos and activity based learning). See the course syllabus [here](#).

Target Audience

Energy-Efficient Controls Systems is designed for students who are Thermostat Repairers, Control specialists or Building Operators who work with controls systems. There are prerequisites for the course:

- Thermostat Repairers or Control Specialists must have completed our “Foundations for Energy Efficient Building Systems” course, passed the “Controls Technical Assessment” and access to DDC/Pneumatic controls.
- Building Operators must have completed our “Foundations for Energy Efficient Building Systems” course, completion of Building Operator Certification Level 1 (BOC-1), passed the “Controls Technical Assessment” and access to DDC/Pneumatic controls.

Learning Path

This course is mapped to the **trades-focused training** category relative to EMI’s suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to 10 hours per a week, or, courses that only run for one full week).

Energy-Efficient Controls Systems

Semester(s)	Spring
Duration	Six sessions over a span of six weeks
Day	Fridays
Time	9 AM to 4 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Energy-Efficient Controls Systems but drops out before satisfactory course completion, a “No Show” fee of \$975 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Renewable Energy 101



renewable energy technologies,
installation, O&M fundamentals



one week

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

Renewable Energy 101 provides City staff with an introduction to renewable energy technologies in the context of the City's clean energy goals. As the City prepares to meet the 100 MW solar installation goal as set forth in "One City: Built To Last" as well as the recent passage of Local Law 92 and 94 which requires green roofs or solar photovoltaic (PV) systems on the City's new construction and renovation projects, City agencies must be prepared to have a well-informed workforce that can provide operations and maintenance support for current and upcoming renewable energy installations. This introductory course will equip interested employees with the knowledge to advocate for, implement and maintain renewable energy technologies, especially on solar PV.

The course covers an overview of renewable energy technologies and policies; solar site scoping, installation and O&M fundamentals; as well as new technologies and battery storage. It consists of four (4) online instructor-led sessions facilitated by subject matter experts, which includes lecture, activities, a hands-on lab and a virtual field trip to a local solar installation. See the course syllabus [here](#).

Target Audience

This course is open to building operators, facilities management staff, and other relevant energy management staff in City buildings who support the installation, maintenance, and monitoring of solar PV and other renewable energy systems.

Learning Path

This course is mapped to the **specialized training** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to 10 hours a week, or, courses that only run for one week).

Renewable Energy 101

Semester(s)	Spring
Duration	Four sessions over a span of six weeks
Day	Tuesday to Friday
Time	9 AM to 4 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Energy-Efficient Controls Systems but drops out before satisfactory course completion, a “No Show” fee of \$975 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Introduction to Load Management



real-time metering, load profile analysis



one day

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

This course provides City staff with an overview of Load Management concepts and techniques aimed at finding ways in which to optimize building operations by reducing energy consumption. Led by an expert in energy engineering, the course is designed to equip staff with the essential information that they need to help their agencies participate in the City's Load Management Program and realize the benefits involved in doing so, including optimizing HVAC system efficiencies and contributing to the City's target of 80% reduction in greenhouse gas emissions by 2050.

During the course, students will discover the policy context for load management, go through relevant load management concepts, discuss key examples, and learn to interpret load profiles, all in an effort to draw connections between your buildings' consumption patterns, and operations to identify savings opportunities. The course consists of a 6-hour interactive online workshop held on a single day. The first part of the workshop involves lecture and discussion, while the second part is comprised of hands-on EnerTrac training, the City's platform for analyzing real-time metering data, with a focus on load profile analysis in an online lab environment.

See the course syllabus [here](#).

Target Audience

The Introduction to Load Management session is open to all interested energy management staff, building operators, and facilities management staff at City buildings. The course does not require a technical background. Please note that DEM may give preference to staff at agencies targeted for near-term Load Management Program participation.

Learning Path

This course is mapped to the **load management** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **LOW** (up to seven hours a week, or, courses that only run for one day).

Introduction to Load Management Cohort

Semester(s)	Spring
Duration	One day
Day	Tuesday
Time	9 AM to 4 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Intro to Load Management but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Load Management Training and Coaching

 building re-tuning, trend chart analysis, system optimization

 four months

*****This cohort is online and Cohort E is by Department of Education (DOE) referral only. Please see the next page for the list of minimum technology requirements.*****

Course Structure

Load Management Training and Coaching (LMTC) is designed to provide building operators with hands-on support in implementing Load Management (LM) measures at your buildings to optimize HVAC system efficiencies. LMTC teaches operators how to utilize their real-time metering data, trending data from your Building Automation Systems and/or data loggers to apply Building Re-tuning (BRT) practices that are specific to their building. While LMTC is relatively new offering, on average, students who have participated in a similar training have achieved total energy consumption savings of 10% at their buildings.

The LMTC course consists of eight sessions over the course of four months taught by subject matter experts. The first three sessions consist of lecture and discussion, where the instructor brings together LM and BRT concepts. The following sessions consist of hands-on virtual coaching, during which the CUNY Building Performance Lab coaches and the DEM Load Management team work closely with students to identify and implement operational improvements at their specific buildings. Support for the completion of the assignments will be provided by BPL and DEM LM engineers. See the course syllabus [here](#).

Target Audience

LMTC is open to interested energy management staff, building operators, and facilities management staff at City buildings where the following is encouraged but not required:

- Have successfully completed BOC-1.
- Are assigned to and/or are responsible for at least one agency building where major equipment can be controlled.
- Can access trend logging functions in a BAS/BMS throughout the duration of the course.

Learning Path

This course is mapped to the **load management** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to seven hours a week, or, courses that only run for one day).

LMTC

Semester(s)	Fall and Spring
Duration	Eight sessions over a span of four months (one session a week, every other week)
Time	9 AM to 12:30 PM (morning sessions) or 1 PM to 4:30 PM (afternoon sessions)
Days	Wednesdays, Thursdays or Fridays
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

IMPORTANT NOTE:

Please note that DEM may prioritize staff at agencies targeted for near-term Load Management Program participation. In general, if Agency Energy Personnel seek to enroll in this training offering, they should confirm that at least one building operator from their agency also will attend.

The DEM LM Team will work to confirm both that potential students meet the prerequisites for the training offering and that their buildings are good near-term candidates for LM participation. Following this process, the DEM LM Team and CUNY SPS will place students in the most suitable cohort, such that they can participate alongside other staff from their own or similar agencies.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Load Management Training and Coaching but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Certified Energy Manager (CEM)



high-performance ops, maintenance and commissioning, M&V



one week



third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

This course enables students to obtain the Certified Energy Manager (CEM) credential by preparing and registering them for the CEM certification exam, offered by the Association of Energy Engineers (AEE). CEM operates as a standard for qualifying energy professionals in the United States and abroad. It is recognized by the U.S. Department of Energy, the Office of Federal Energy Management Programs, and numerous state energy offices, utilities, corporations, and energy service companies.

The course consists of four in-person instructional sessions taught by subject matter experts and a full-day comprehensive certification exam. The five-day course is offered over a one-week period. To successfully complete the course, students must meet the stated eligibility criteria; attend all instructional sessions; submit an exam application form before sitting for the exam; (provided during the prep period); and pass the four-hour, written, open-book CEM exam. See the course syllabus [here](#).

Target Audience

CEM is designed for students who have previous intensive energy management training or experience. DEM will give preference to students who have successfully completed both BOC-1 and BOC-2, but accommodate other qualified students as space permits. Students seeking to substitute other advanced training or experience for BOC-1 or BOC-2 should reach out to CUNY SPS to request enrollment permission. All students must meet AEE's combined education-experience eligibility requirements summarized on the next page (i.e., they can qualify under any one of the six qualification pathways).

Learning Path

CEM is mapped to the **AEE certification** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **HIGH** (up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study).

Certified Energy Manager

Semester(s)	Fall and Spring
Duration	Four sessions over a span of one week + one self-scheduled exam day
Day	Monday to Thursday
Time	8 AM to 5 PM
Location	Virtual via Zoom
Time Commitment to	High
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

Education and Experience Requirements for Certification

4-yr. degree in Engineering or Architecture, AND	3+ yrs. experience in energy engineering or energy management
4-yr. degree in Environmental Science or Physics, AND	4+ yrs. experience in energy engineering or energy management
4-yr. degree in Business (or related field), AND	5+ yrs. experience in energy engineering or energy management
2-yr. degree in Energy Management, AND	6+ yrs. experience in energy engineering or energy management
2-yr. degree in a technical topic, AND	8+ yrs. experience in energy engineering or energy management
No specific educational background, AND	10+ yrs. experience in energy engineering or energy management

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for CEM but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Certified Energy Auditor (CEA)

 energy use and economic analysis,
energy auditing

 one week

 third-party certification

This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.

Course Structure

This course enables students to take the Certified Energy Auditor (CEA) certification exam, which is offered by the Association of Energy Engineers (AEE). CEA operates as a standard for qualifying energy professionals in the United States and abroad; the CEA course is designed to provide participants with an in-depth, technical review of energy auditing. A CEA is an individual who evaluates and analyzes how energy is being used in facility and identifies energy conservation opportunities and makes recommendations where consumption can be reduced and optimized. The course will help improve the practice of energy auditors by encouraging energy auditing professionals in a continuing education program of professional development.

The CEA course consists of four in-person instructional sessions taught by subject matter experts and one (1) day for the comprehensive certification exam, administered on the fourth day. To successfully complete the course, students must meet the stated eligibility criteria and pass an open book examination. See the course syllabus [here](#).

Target Audience

CEA is designed for students who are energy managers, energy analysts, building operators, senior stationary engineers, stationary engineers, custodian engineers, architects, engineers, project managers, construction project managers, and trades supervisors are encouraged to enroll. DEM will give preference to students who have successfully completed both BOC-1 and BOC-2, but accommodate other qualified students as space permits. Students seeking to substitute other advanced training or experience for BOC-1 or BOC-2 should reach out to CUNY SPS to request enrollment permission. All Students must meet AEE's combined education experience eligibility requirements summarized on the next page.

Learning Path

CEM is mapped to the **AEE certification** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **HIGH** (up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study).

Certified Energy Auditor

Semester	Spring
Duration	Four sessions over a span of one week + one self-scheduled exam day
Day	Monday to Thursday
Time	8 AM to 5 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	High
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

Education and Experience Requirements for Certification

4-yr. degree in engineering/architectural OR Professional Engineer (PE) or Registered Architect (RA), AND	3+ yrs. experience in energy auditing and/or participating in team doing energy assessments
4-yr. unrelated degree, AND	4+ yrs. experience in energy auditing and/or participating in team doing energy assessments
2-yr. associate degree, AND	5+ yrs. experience in energy auditing and/or participating in team doing energy assessments
Current Status of Certified Energy Manager (CEM), AND	3+ yrs. experience in energy auditing and/or participating in team doing energy assessments
No specific educational background, AND	10+ yrs. experience in energy auditing and/or participating in team doing energy assessments

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for CEA but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Certified Building Commissioning Professional (CBCP)

 building commissioning concepts, process, and project management

 one week

 third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The CBCP course prepares individuals to take the Certified Building Commissioning Professional (CBCP) certification exam, which is offered by the Association of Energy Engineers (AEE). CBCP operates as a standard for qualifying energy professionals in the United States and abroad. A CBCP improves the practice of building commissioning by encouraging professionals in a continuing education program of professional development related to commissioning.

The CBCP course consists of a total of four (4) days, split between three and a half (3.5) days of in person instructional sessions taught by subject matter experts and a half (0.5) day for the comprehensive certification exam, administered on the afternoon of the fourth day. To successfully complete the course, students must meet the stated eligibility criteria; and pass an open book examination. The CBCP course is designed to provide participants with an in-depth understanding of building commissioning concepts, processes, and project management. See the course syllabus [here](#).

Target Audience

CBCP is designed for students who will review the technical details of the commissioning process, including building operators, senior stationary engineers, stationary engineers, custodian engineers, building managers, architects, engineers, project managers, construction project managers, and supervisors of trades teams such as electricians and maintenance mechanics are encouraged to enroll. DEM will give preference to students who have successfully completed both BOC-1 and BOC-2, but accommodate other qualified students as space permits. Students seeking to substitute other advanced training or experience for BOC-1 or BOC-2 should reach out to CUNY SPS to request enrollment permission. All Students must meet AEE's combined education experience eligibility requirements summarized on the next page.

Learning Path

CBCP is mapped as an **AEE certification** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to 10 hours a week, or, courses that only run for one week).

Certified Building Commissioning Professional

Semester	Spring
Duration	Four sessions over a span of one week + one self-scheduled exam day
Day	Monday to Thursday
Time	9 AM to 5 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

Education and Experience Requirements for Certification

4-yr. degree in engineering/architectural OR Professional Engineer (PE) or Registered Architect (RA), AND	3+ yrs. experience in energy auditing and/or participating in team doing energy assessments
4-yr. unrelated degree, AND	5+ yrs. experience in energy auditing and/or participating in team doing energy assessments
2-yr. associate degree, AND	5+ yrs. experience in energy auditing and/or participating in team doing energy assessments
No specific educational background, AND	10+ yrs. experience in energy auditing and/or participating in team doing energy assessments
Current Status of Certified Energy Manager (CEM)	

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for CEA but drops out before satisfactory course completion, a “No Show” fee of \$1,875 will be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Certified Measurement & Verification Professional (CMVP)

 IPMVP core concepts, metering and considerations, modeling

 one week

 third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The CMVP course focuses on the development of metrics to measure energy usage, verify savings, and evaluate and prioritize investments and prepares individuals to take the Certified Measurement and Verification Professional (“CMVP”) exam, which is offered by the Association of Energy Engineers (“AEE”). Under standard in-person operating conditions, the course consists of a total of three (3) days, split between two (2) days of in-person instructional sessions taught by subject matter experts and one (1) day for the comprehensive certification exam administered remotely on a day selected by the participant.

To successfully complete the course, students must meet the stated eligibility criteria; and pass an open book examination. The CMVP course is designed to provide participants with an in-depth understanding of energy measurement and verification, as well as all its related concepts, processes, and project management.

Target Audience

CMVP is designed for students who will review the technical details of the energy measurement and verification process, including building operators,

senior stationary engineers, stationary engineers, custodian engineers, building managers, architects, engineers, project managers, construction project managers, and supervisors of trades teams such as electricians and maintenance mechanics are encouraged to enroll. DEM will give preference to students who have successfully completed both BOC-1 and BOC-2, but accommodate other qualified students as space permits. Students seeking to substitute other advanced training or experience for BOC-1 or BOC-2 should reach out to CUNY SPS to request enrollment permission. All Students must meet AEE’s combined education experience eligibility requirements summarized on the next page.

Learning Path

CMVP is mapped to the **AEE certification** category relative to EMI’s suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to 10 hours a week, or, courses that only run for one week).

Certified Measurement & Verification Professional

Semester	Spring
Duration	Two sessions + one self-scheduled day for the certification exam
Day	TBD (please refer to the course schedule)
Time	9 AM to 4 PM
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor participant attendance and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

Education and Experience Requirements for Certification

Bachelor's degree OR Professional Engineer (PE) OR Registered Architect (RA) AND	3+ yrs. experience in energy auditing and/or participating in team doing energy assessments
4-yr. unrelated degree, AND	5+ yrs. experience in energy auditing and/or participating in team doing energy assessments
2-yr. associate degree, AND	5+ yrs. experience in energy auditing and/or participating in team doing energy assessments
Current Status of Certified Energy Manager (CEM) AND	3+ yrs. experience in energy auditing and/or participating in team doing energy assessments
No specific educational background, AND	10+ yrs. experience in energy auditing and/or participating in team doing energy assessments

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for CEA but drops out before satisfactory course completion, a "No Show" fee of \$1,875 will be assessed to their agency's training department in accordance with the CTC's cancellation policy.

Passive House Tradesperson (CPH/T) Training

 thermal insulation and thermal bridges, air tightness, envelope

 seven weeks

 third-party certification

*****This cohort is online via Zoom. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The Certified Passive House Tradesperson (CPH/T) Training enables participants to gain a good understanding of the interactions and interdependency of building components in a Passive House project. This course also enables participants to assess the energy efficiency of any planning modifications and to solve problems with the designers involved in construction due to a similar knowledge base. The course consists of seven (7) self-paced lessons and seven (7) Q&A online sessions over the span of seven weeks, plus a single-day exam that offers certification (as a Passive House tradesperson). Topics include thermal insulation, thermal bridges, windows and transparent components, air tightness and moisture management, mechanical ventilation with heat and recovery-efficient heating, cooling, and domestic hot water.

Target Audience

The Certified Passive House Tradesperson (CPH/T) course is designed for Trades personnel and supervisors working in City buildings.

Learning Path

This course is mapped to the **trades-focused training** category relative to EMI's suggested [learning paths](#). The **time commitment to course (TCC)** is **MEDIUM** (up to 10 hours a week, or, courses that only run for one week).

Passive House Tradesperson (CPH/T) Training

Semester	Fall
Duration	Seven sessions in a span of two months + a self-scheduled exam
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

Instructors and staff will actively monitor course module completion and reserve the right to decline issuance of a certificate of completion should virtual attendees not actively participate based on the rules set at the beginning of the course.

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for Passive House but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

High-Performance Building Design: Applications and Future Trends



new technologies and designs, future trends in high-performance buildings



half-day

*****This cohort is online. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The High-Performance Building Design: Applications and Future Trends course presents the applications of new technologies and design concepts to help to achieve high-performance buildings, including net-zero / nearly net-zero buildings, as well as future trends in store (e.g., smart grid, smart buildings, “future proofing” design, resiliency). Along with the technical aspects of high-performance buildings, the course will also examine high-performance building design from both a technical perspective and from the perspective of investors, allowing for a more well-rounded understanding of all the different players involved. Finally, the course will delve into the future of high-performance buildings and how ASHRAE Standards address these important themes.

The course consists of an online three-hour long workshop taught by ASHRAE instructors. You can find out more information about it [here](#).

Target Audience

This course is designed for those with a background in energy management. Beyond this, it is also available for individuals with experience as such technicians, design engineers, facility managers, and building operators.

Learning Path

High-Performance Building Design is mapped to the **specialized training category** for facility managers and building operators within EMI's suggested [learning paths](#). The **time commitment to course (TCC) is LOW** as it is a course that only runs for half a day.

High-Performance Building Design: Applications and Future Trends

Semester	Spring
Duration	One half-day session (totaling three hours)
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for this course but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Energy Modeling Best Practices and Applications



modeling principles, life cycle cost analysis, valuable quality control



two days

*****This cohort is online. Please see the next page for the list of minimum technology requirements.*****

Course Structure

Energy Modeling Best Practices and Applications covers the fundamentals of building energy modeling and explains how to use modeling to guide design decisions. This is a software-neutral training that enables participants to understand how to integrate modeling into the design process, starting from the programming stage to post-occupancy and measurement and verification (M&V). Particularly, the course will explore modeling principles and tips related to building envelopes, plug loads, lighting systems, and HVAC systems. Finally, Energy Modeling will appropriate methods for presenting results and the appropriate use of modeling throughout the project life cycle and its cost analysis.

The course consists of two online half-day workshops taught by ASHRAE instructors. You can find out more information about it [here](#).

Target Audience

This course is designed for energy managers and engineers, building industry professionals, architects, and LEED® accredited professionals. However, Energy Modeling is also available for building operators and facility managers who already have some background in this area and want to learn more about this subject matter.

Learning Path

Energy Modeling Best Practices and Applications is mapped to the **specialized training category** for engineers and project managers along with facility managers and building operators within EMI's suggested [learning paths](#). The **time commitment to course (TCC) is LOW** as it is a course that only runs for one day.

Energy Modeling Best Practices and Applications

Semester	Spring
Duration	Two half-day sessions (totaling six hours)
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for this course but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Introduction to BACnet®



BACnet® implementation, testing and certification, BIBBS and interoperability specification



half-day

*****This cohort is online. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The Introduction to BACnet® course helps students understand elements required to successfully plan for BACnet implementation, including issues that must be addressed to achieve interoperability. This course will explain what BACnet's is and how it works, including the basic components of any multi-vendor or multi-discipline BACnet control system. Of note, the capacity to merge different systems using BACnet, including integrating older systems with BACnet®-based systems, will also be discussed.

The course consists of an online three-hour long workshop taught by ASHRAE instructors. You can find out more information about it [here](#).

Target Audience

This course is designed for design engineers, energy managers, building operators, facility managers, as well as technicians and architects.

Learning Path

Introduction to BACnet is mapped to the **specialized training category** for design engineers and technicians, as well as building operators and energy managers within EMI's suggested [learning paths](#). The time **commitment to course (TCC)** is **LOW** as it is a course that only runs for half a day.

Introduction to BACnet®

Semester	Spring
Duration	One half-day session (totaling three hours)
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for this course but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Improving Existing Building Operation

 HVAC maintenance and optimization, ASHRAE standards, improved management strategies

 three days

*****This cohort is online. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The Improving Existing Building Operations course offers a well-rounded knowledge of the proper operation and maintenance of existing HVAC systems. The course focuses on the importance of proper operation and maintenance of existing HVAC systems to increase building performance, with a strong emphasis on meeting multiple ASHRAE standards and guidelines (e.g., ASHRAE Standard 100, 105, 14). This training equips attendees with the techniques to assess existing building performance to make their facilities operate more efficiently and economically.

The course consists of three half-day online sessions (totaling 12 hours), taught by ASHRAE Fellows and instructors. You can find out more information about it [here](#).

Target Audience

The intended audience for this course includes building operators, facility and energy managers, and design engineers.

Learning Path

Building Operation's is mapped to the **building operations training category** for facility managers and building operators within EMI's suggested [learning paths](#). The time commitment to course (TCC) is MEDIUM.

Improving Existing Building Operation

Semester	Spring
Duration	Three half-day sessions (totaling twelve hours)
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Medium
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for this course but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

Operations & Maintenance of High-Performance Buildings



O&M best practices and opportunities, high-performance buildings



two days

*****This cohort is online. Please see the next page for the list of minimum technology requirements.*****

Course Structure

The Operations & Maintenance of High-Performance Buildings course offers practical insights regarding the operation and maintenance (O&M) practices for both standard and high-performance buildings. This course discusses the interdependency between energy efficiency and operations & maintenance and provides actionable tips on finding and addressing O&M opportunities.

The course consists of two half-day workshops, including an interactive group project to reinforce concepts such as 1) how to identify and define energy and maintenance management metrics, and 2) how to make the business case for changes to an existing building and its systems. You can find out more information about it [here](#).

Target Audience

The intended audience for this course includes building operators, energy and facility managers, and design engineers. Specifically, the course would be most beneficial to staff with three to ten years of experience interested in focusing on O&M for high-performance buildings.

Learning Path

The Operations & Maintenance of High-Performance Buildings course is mapped to the **building operations category** for facility and energy managers, building operators and design engineers within EMI's suggested [learning paths](#). The time commitment to course (TCC) is LOW.

Operations & Maintenance of High-Performance Buildings

Semester	Spring
Duration	Two half-day sessions (totaling six hours)
Day	TBD (please refer to the course schedule)
Time	TBD (please refer to the course schedule)
Location	Virtual via Zoom
Time Commitment to Course (TCC)	Low
Minimum Technology Requirements	Webcam (Required) Microphone & Speakers/Headphones OR Headset (Required) Online Broadband (non-secured) bandwidth of 3 Mbps. A wired connection is highly recommended. Complete System Requirements for Zoom

*****To enroll, potential students should apply through the online registration portal at bit.ly/EMI-Registration*****

Cancellation Fee

If a City employee registers for this course but drops out before satisfactory course completion, a “No Show” fee of \$400 may be assessed to their agency’s training department in accordance with the CTC’s cancellation policy.

DEM-offered Energy Training

The following training will be offered in-house by the DCAS Division of Energy Management (DEM), with support from CUNY SPS and CUNY BPL, during Learning Fairs and throughout the fiscal year. These courses are offered on-demand and targeted towards Agency Energy Personnel (AEP) and similar support staff.

For more information regarding the schedule and enrollment for these courses, please reach out to DEM's Program Manager for Training, Gretel Guivelondo, at gguivelondo@dcas.nyc.gov.

COURSE	BRIEF DESCRIPTION
Introduction to Capital Project Registration and Contracting	This session prepares project and energy management staff to successfully navigate the City's capital contracting process to support the implementation and delivery of these energy projects. Participants will be able to understand the capital project fundamentals and policies, track the capital project lifecycle, and identify and apply best practices.
Navigating the Certificate to Proceed and Project Registration Process	This training dives into the two key components of the capital project registration and contracting process: (1) preparation of the certificate to proceed application and (2) project registration. This training enables participants to understand the role of the certificate to proceed and project registration in the overall capital project development process. In addition, participants will learn how to prepare certificate to proceed and registration applications using the standardized templates recently prepared by DEM.
Tools and Best Practices for HVAC Operations in the Wake of COVID-19	This workshop shares industry best practices and newly developed tools that may help support building operators in managing their buildings in the wake of COVID-19. Geared towards both building operators and energy management staff, the session provides participants the opportunity to 1) understand COVID-19 HVAC mitigation methods recommended by ASHRAE, 2) become familiarized with two new tools (AIRC and VII) that help evaluate the potential for airborne transmission of COVID-19 indoors and help calculate your heating and cooling loads for the resulting ventilation scenarios, and 3) participate in a Q&A with the instructors regarding building-specific queries related to the tools and best practices discussed.

COURSE BRIEF DESCRIPTION

Introduction to Energy Data and Tools

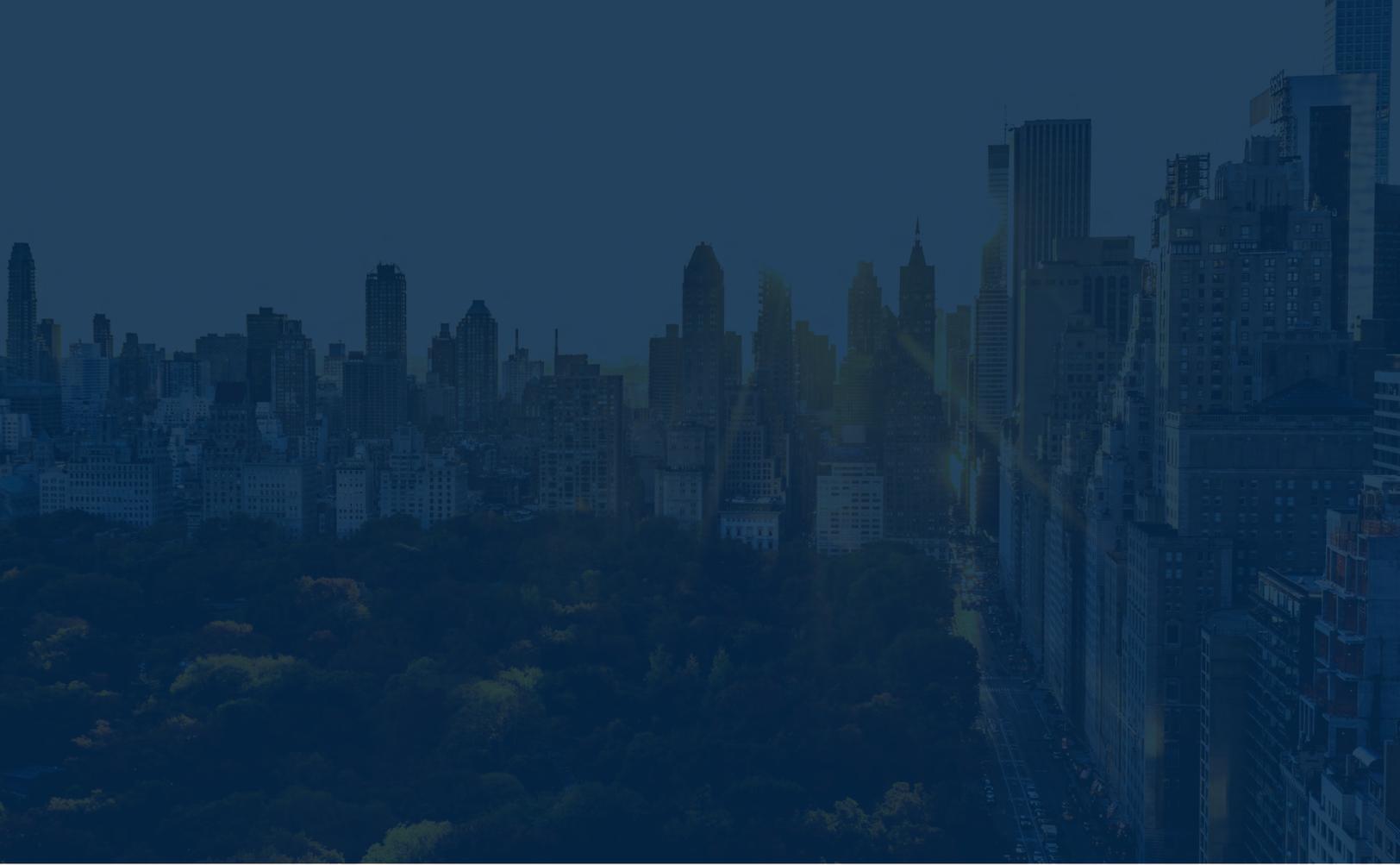
This training shows new and interested City staff how to acquire and report on the City of New York’s energy consumption and cost data. This session, geared towards both building management and energy management staff, enables learners to navigate the EC3 and EnerTrac platforms, download and manipulate municipal energy reports for their agency, and create load profile baselines for their buildings.

Overview of Real-Time Metering

This session provides building operators and facility managers a brief background on RTM deployment efforts and progress, Local Law 45 of 2018, as well as a review of RTM components and visualization of energy use data via EnerTrac tool. Most importantly, participants will also learn how to take advantage of RTM technology and support DEM’s energy efficiency programs by leveraging simple EnerTrac features.

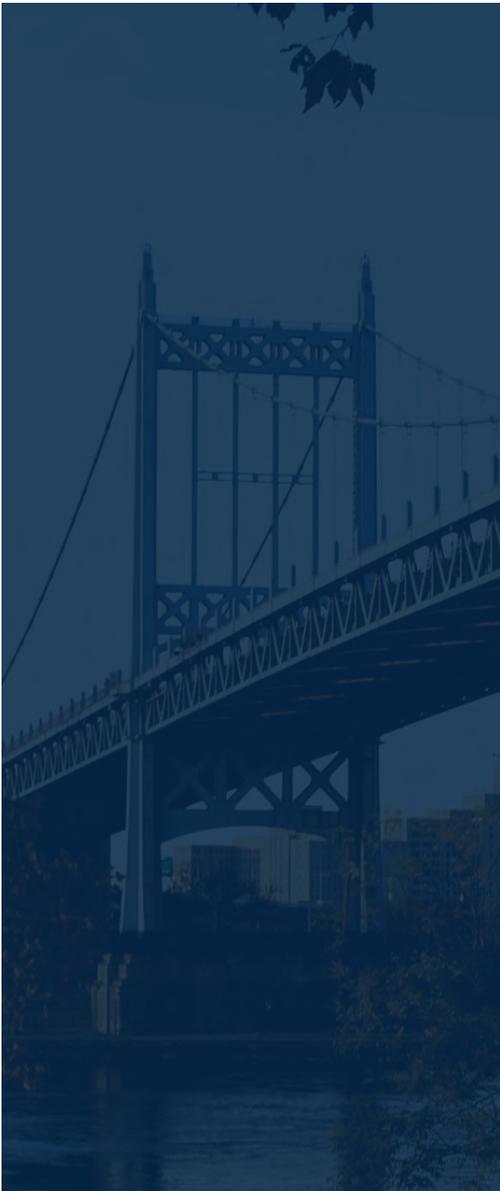
Energy Billing Analytics

This session introduces City staff and energy liaison officers to fundamentals of energy billing concepts and the tools that will help them monitor and analyze energy data, with a focus on how to manage and conserve energy cost & usage at their agencies. Participants will be able to identify the benefits of energy data analysis, recognize various energy types’ account and billing components, and utilize various platforms to interpret data and look for energy billing anomalies.



Other Information to Help You Get Started

Learning Paths / Course Selection



Through EMI, DEM offers a diverse set of courses that enable each participant to design their own learning path. Participants can then maintain their certification or chart their own path by continuing their education through the Learning Fair or other external workshops. Current courses are grouped into **six training categories**: foundational, building operations, AEE certification, load management, specialized, and trades-focused.

Staff can also select the courses that are right for them based on the following factors:

- **Certification(s) offered:** Some courses offer nationally-recognized certifications, such as BOC-1, BOC-2, CEM, CEA, CBCP and CMVP.
- **Level of on-going expertise:** Some EMI courses require students to have completed specific pre-requisites to ensure that they are prepared to be successful.
- **Breadth of topics covered:** Some EMI courses offer a broad overview of the energy management field, while others focus on specific topics.
- **Time commitment:** Some EMI courses are multi-day, while others are a single day or less. Each EMI course has different requirements for time spent in class for instructor-led learning *and* outside of class to conduct research, develop projects, complete online learning modules or reading assignments, and prepare for exams. The **Time Commitment to Course (TCC)**, which considers time spent in class and outside of class (for projects and self-study), as well as the duration of the course itself, can be classified as **Low, Medium** or **High**. **Low** consists of up to seven hours a week, or, courses that only run for one day. **Medium** consists of up to 10 hours a week, or, courses that only run for one week. **High** consists of up to 15 hours a week over multiple weeks, or, courses that include a certification exam that requires further subject matter study.

The current EMI courses are mapped into six categories below:

	Foundational Training	Building Operations Training	AEE Certification	Trades-Focused Training	Specialized Training	Load Management Training
Courses	Fundamentals of Building Systems	Building Operator Certification: Level 1 (BOC-1) Building Operator Certification: Level 2 (BOC-2) Improving Existing Building Operation Operations & Maintenance of High-Performance Buildings	Certified Energy Manager (CEM) Certified Energy Auditor (CEA) Certified Measurement & Verification Professional (CMVP) Certified Building Commissioning Professional (CBCP)	Foundations of Energy-Efficient Operations Energy-Efficient Controls Systems Passive House Tradesperson (CPH/T) Training	Renewable Energy 101 Energy Modeling Best Practices and Applications Introduction to BACnet® High-Performance Building Design: Applications and Future Trends	Introduction to Load Management Load Management Training and Coaching
Target Audience	City energy management staff who are not building operators	Building operators or City energy management staff with a solid working knowledge of building systems and equipment	All interested City energy management staff and building operators who meet necessary experience and educational prerequisites	Tradespeople focused on energy-efficiency, building operations and maintenance	All interested City energy management staff and building operators	All interested City energy management staff and building operators
Time Commitment to Course	Low	Medium to High	High	Low to Medium	Low to Medium	Low

Some suggested learning paths include the following:

Energy Staff Path

For energy staff with limited building operations experience

- **Foundational Training**
Fundamentals of Building Systems
- **Building Operations Training**
Building Operator Certification Level 1 *and*
Building Operator Certification Level 2
- **AEE Certification**
Certified Energy Manager *or*
Certified Energy Auditor *or*
Certified Measurement & Verification
Professional *or*
Certified Building Commissioning Professional
- **Maintenance of Certification through continuing education**
for example
Measurement and Verification *through EMI* *or*
Blueprint Reading *through the Learning Fair*

Building Operator Path

For building operators and facility managers

- **Building Operations Training**
Building Operator Certification Level 1 *and*
Building Operator Certification Level 2
- **Other Training Categories (LM, Specialized, Trades)**
Load Management Training and Coaching
- **AEE Certification**
Certified Energy Manager
- **Maintenance of Certification through continuing education**
for example
Renewable Energy 101 *through EMI* *or*
Boiler Optimization *through the Learning Fair*

Tradesperson Path

For tradespeople and interested building operators

- **Trades-Focused Training**
Energy-Efficient Controls Systems
Foundations of Energy-Efficient Operations
ASHRAE courses
Passive House Tradesperson (CPH/T) Training
OR
- **Building Operations Training**
Building Operator Certification Level 1 (BOC-1)
- **Maintenance of Certification through continuing education**
for example
Renewable Energy 101 *through EMI* *or*
Boiler Optimization *through the Learning Fair*

NYC Energy Tools / Field Equipment Lending Library (FELL)

Through the Energy Management Institute's courses, City of New York staff are also able to learn through hands-on equipment practice with the support of the NYC Energy Tools, formerly the Field Equipment Library ("FELL"). The NYC Energy Tools is a shared library of specialized energy diagnostic and measurement equipment that is available to all City staff working on energy management projects in City buildings. NYC Energy Tools is jointly run by DEM and CUNY BPL.

What equipment does this resource have?

NYC Energy Tools is stocked with equipment for measuring, diagnosing, and optimizing a range of building systems and equipment, from boilers to air handling units to solar panels. This resource includes more than 1,200 items, including but are not limited to: Digital Light Meters, Thermo-Anemometers, Ultrasonic Meters, Portable Combustion Analyzers, Clamp Meters, HOBO Data Loggers, and Thermal Imaging Cameras. Visit the online library at www.nycenergytools.com.

Where is the NYC Energy Tools located?

NYC Energy Tools is mainly located at 31 Chambers Street, New York, NY 10007. The NYC Energy Tools also has another office in 96 Greenwich St New York, NY 10006. It is open from 9:00 am to 5:00 pm Monday-Friday.

How can City staff borrow equipment from the NYC Energy Tools?

City staff can search the library online or download the catalog to identify the equipment that they need. They can then request by filling out the NYC Energy Tools Equipment Loan form. **City staff should request equipment a week before they plan to use it. Currently, equipment pick-up and drop-off is by appointment only.** After interested staff have completed the Field Equipment Request Form,

CUNY BPL's [Felix Rodriguez](#) will reach out to schedule the best possible pick-up time.

How can City staff learn how to use equipment from NYC Energy Tools?

NYC Energy Tools has a dedicated, full-time equipment specialist on staff to give advice on project design and tool selection; provide equipment training and installation assistance; and offer follow-up and evaluation. Equipment demonstrations are also provided during the Learning Fairs and within specific EMI courses such as BOC-1, BOC-2, and LMTC.

Registration Guidelines

All interested City employees can apply for courses through the [online registration portal](#).

GUIDELINES

Supervisor / Agency Approval

Students must ensure that they have supervisor and/or agency (agency training liaison or HR department) approval before registering for a course. EMI will copy the supervisor on the student's course confirmation to ensure that the supervisor is aware of the learning objectives and time commitment. Failure **to obtain supervisor approval will result in cancellation** of the student's registration.

Prerequisites

Students must confirm that they have completed the course prerequisites. EMI may also check students' enrollment history to determine their eligibility to attend a course.

Enrollment Confirmation

Please note that **students who have successfully submitted their registration are not automatically enrolled in a course**. All classes are free of charge for City employees, and there is a high demand for certain courses. In general, EMI approves student enrollment on first-come, first-served basis, but also considers whether students have completed necessary pre-requisites or the course subject matter is relevant to their job. **The EMI team will directly reach out to students who are confirmed** to attend the course with a calendar invite and next steps.

Waitlists

If a course is at full capacity, a student can add their name to the waitlist during the registration period. The EMI team uses the waitlist to fill open spaces right before the start of the course. The student will receive an email from the EMI team if they are moved off the waitlist and enrolled in the course.

Online Registration Process

The online registration link is bit.ly/EMI-Registration. Click on the “Register For EMI Courses” button on the portal to begin the registration process. There are five sections in the registration form:

Courses

1. Begin registration by selecting the course(s) you are looking to attend.
 - Review the course description for the course dates, duration, and overall time commitment.
 - Refer to the this catalog for further descriptions and information on how to select courses right for you.

Applicant Information

1. Provide your name, email, and supervisor’s information.
2. By clicking on the “Supervisor Approval” box, you are confirming that you have obtained supervisor / agency approval to register for an Energy Management Institute course. By also clicking on the box, you are agreeing for EMI to copy your supervisor on initial correspondence regarding your acceptance into the course.
3. If you have registered before in CUNY’s *Swoogo* system, you may be prompted to sign in after you have submitted your information (after clicking on the “Continue” button).
 - You may continue to log in if you remember your password. You may also request to reset your password.
 - You may also skip this step by clicking on the “Skip This Step...” link.

Cancellation of Online Registration

If you are not able to attend a previously reserved class, please **log in to the registration site to cancel your application** as soon as possible, so that your vacated spot can be reallocated to a waitlisted applicant.

Error Messages / Additional Help

If you have encountered a *Swoogo* system error, or, for questions and concerns regarding your online application and waitlist status, please contact EMITraining@sps.cuny.edu.

Additional Information

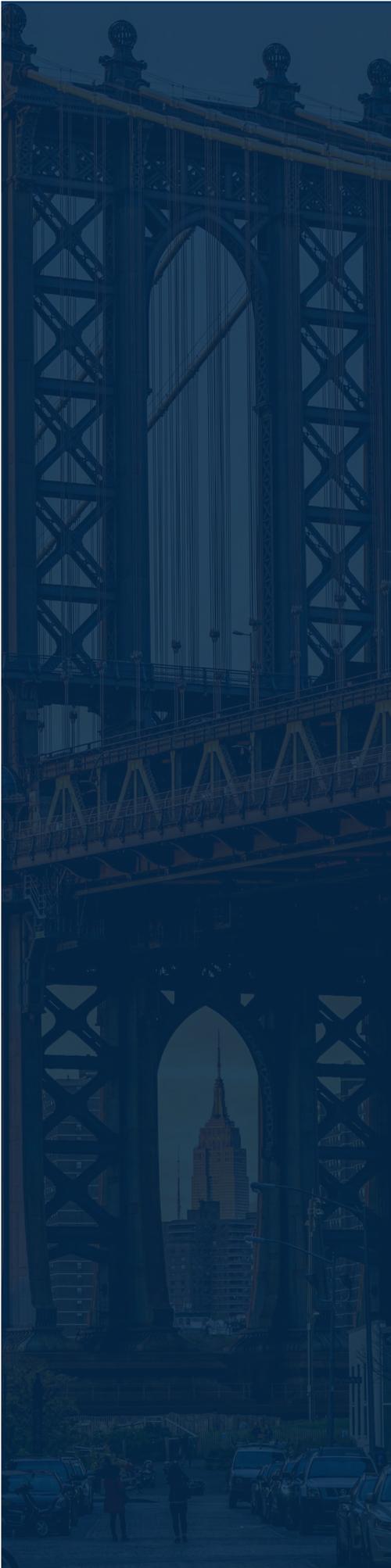
1. Continue providing your additional applicant information such as agency, job title, etc.
2. Fields with an asterisk (*) are mandatory. Fields without an asterisk are optional and may be left blank.
3. Click “Continue” when you are done.

Registration Acknowledgement

1. Confirm your supervisor / agency approval, as well as your understanding of the course requirements and time commitment for the course(s) you have selected.

Confirmation

1. Click on the magnifying glass icon to review your registrant details and course selections.
2. You will be able to modify your registration while the registration period is still open.
3. You will receive an email notification (1) when you have successfully registered and (2) when your request for enrollment for the course is approved.



Appendix: Course Syllabi

Fundamentals of Building Systems | Course Syllabus

This course is designed to provide foundational energy management knowledge for City staff. It provides an overview of critical building systems and equipment, including their relationship to energy consumption; explains electrical and mechanical engineering concepts pertinent to building operations; and introduces best practices for energy efficiency in City buildings. The **time commitment to course (TCC)** is **low**.

Week 1 | Course Orientation

This session provides an overview of the course, NYC and DEM's climate change initiatives and responsibilities, and a high-level discussion on energy efficiency. The participant also receives a walkthrough of the learning system and how to access the self-paced training.

- 4 hours of online instruction
- Post-assessment

Week 2 | Self-paced Study // Lab

The participant dedicates this period to self-paced study and completion of assigned online lessons.

- 10 self-paced online lessons (~2.5 hours)

Week 3 | Recap

This session provides a recap of all completed training and a discussion of overview of codes, zones, regulatory requirements, as well as energy efficiency.

- 4 hours of online instruction
- Post-assessment

Building Operator Certification Level 1 (BOC-1) | Course Syllabus

This course is the foundational energy efficiency course for building operators working in City facilities. The **time commitment to course (TCC)** is high.

Week 1 | Course Orientation

This session introduces the course and provides an overview of topics and projects for the semester.

- 7 hours of online instruction

Week 2 | Building Electrical Systems

This session teaches the basics of electricity and schematics for building electrical systems, as well as general electrical safety concepts.

- 7 hours of online instruction
- 2 self-paced online lessons (~1.5 hours)
- One required reading textbook (~100 pages)

Week 3 | Efficient Lighting Fundamentals

This session focuses on efficient lighting fundamentals and how participants should apply them.

- 7 hours of online instruction
- 2 self-paced online lessons (~2 hours)
- One required reading textbook (~106 pages)

Week 4 | Motors

This session outlines applied motors principles, applied on-site generation and load management.

- 7 hours of online instruction

Week 5 | HVAC: Building Heating & Cooling Loads

This session is dedicated to building loads.

- 7 hours of online instruction
- 2 self-paced online lessons (~2 hours)
- One required reading textbook (~21 pages)
- Module 1 exam
- Module 1 project due

Week 6 | HVAC Systems

This session introduces the analysis of a central plant: boiler, chillers, and HVAC Air System.

- 7 hours of online instruction
- 2 self-paced online lessons (~2 hours)
- One required reading textbook (~147 pages)

Week 7 | Indoor Environmental Quality (1)

The session teaches the fundamentals of applied controls, as well as ventilation and pressure.

- 7 hours of online instruction
- Three required reading textbooks (~166 pages)

Week 8 | Indoor Environmental Quality (2)

This session focuses on basic energy units and conversions as well as reading, accessing, and manipulating energy data through the EC3 portal.

- 7 hours of online instruction
- Module 2 exam
- Module 2 project due

Week 9 | Project Development 1 // No classes

A self-study week dedicated to project development and completion of online lessons assigned.

- 3 self-paced online lessons (~2.5 hours)
- One required reading textbook (~75 pages)

Week 10 | Interpreting Energy Data

This session focuses on applying energy data and provides an introduction to applied energy auditing.

- 7 hours of online instruction

Week 11 | Project Development 2 // No classes

A self-study week dedicated to project development and completion of online lessons assigned.

- 2 self-paced online lessons (~1.5 hours)

Week 12 | Applied Energy Audit

This session discusses an applied energy audit case and low-cost building operational measures.

- 7 hours of online instruction
- Module 3 exam
- Module 3 project due

Week 13 | Project Development 3 // No classes

A self-study week dedicated to project development and completion of online lessons assigned.

- 1 self-paced online lessons (~1 hour)

Week 14 | Maintenance for Performance

This session focuses on applying maintenance for performance and energy calculations.

- 7 hours of online instruction

Week 15 | Project Development 4 // No classes

A self-study week with online instructor support to develop the capstone project.

Week 16 | Capstone Project and Course Evals

This is the last session of the course.

- 7 hours of online instruction
- Module 4 exam
- Final capstone project and presentation due

Energy-Efficient Controls Systems | Course Syllabus

This instructor-led learning course provides an interactive opportunity for skilled tradespeople who work within agency buildings to discover, discuss, and analyze the effects of building controls systems on energy efficiency in municipal building operations within the City of New York. The **time commitment to course (TCC)** is **medium**.

Week 0 | Course Prep

Participants must choose one piece of equipment from their building and prepare a sequence of equipment operations and sensor inventory accordingly.

Week 1 | Control Points Overview

This session teaches the basics of control points, as well as how to use equipment to measure data and identify trends.

- 7 hours of online instruction

Week 2 | Setpoints, Alarms, and Resets

This session focuses on setpoints, alarms, resets, and scheduling. Participants will learn how to calibrate and test sensors to ensure energy efficiency, comfort, indoor quality, and property protection.

- 7 hours of online instruction

Week 3 | Multi-Meter Lab (for in-person) // Virtual BMS Tour (for online session)

This session is an immersion multi-meter/building management system lab experience. Participants dedicate time to the individual project.

- 7 hours of online instruction

Week 4 | Protocols and Programming

This session outlines the cost of compressed air and output types, as well as database, graphics, and programming.

- 7 hours of online instruction

Week 5 | High-Performance Sequences of Operations

This session focuses on the high-performance sequences of operations, energy-saving benefits of VFDs, and preventative maintenance.

- 7 hours of online instruction

Week 6 | Final session – Reports and Retro-commissioning

This session teaches how to analyze reports and retro-commissioning, as well as how to communicate

specific data with IT. The session concludes with a quiz and a project presentation.

- 7 hours of online instruction
- Exam
- Capstone project and presentation due

Renewable Energy 101 | Course Syllabus

The Renewable Energy 101 course provides City staff with an introduction to renewable energy technologies in the context of the City's clean energy goals. This introductory course will equip interested employees with the knowledge to advocate for, implement and maintain renewable energy technologies, especially on solar PV. The **time commitment to course (TCC)** is **medium**.

Day 1 | Course Orientation

This session provides participants the opportunity to learn about renewable technologies and policies, solar trends, site selection and planning, codes, inspections, finance mechanisms, and the project approval process. Participants are also introduced to NYC's road map of reaching 100MW of solar by 2025.

- 7 hours of online instruction
- 1 self-paced online lesson

Day 2 | Building Electrical Systems

This session teaches the basics of installation fundamentals, operations, and maintenance for Solar PV, including data acquisition systems and management, design, installation, reports, and troubleshooting.

- 7 hours of online instruction

Day 3 | Innovation in Solar PV

This session outlines the innovations in the solar power field and battery energy storage, reduced carbon, and increased resiliency.

- 7 hours of online instruction

Day 4 | Solar Lab

This session focuses on practical exercises and case studies, hands-on activities, and concludes with a workshop about equipment repair and site safety.

- 7 hours of online instruction

Load Management Training and Coaching | Course Syllabus

The Load Management Training and Coaching (LMTC) course is designed to provide building operators with hands-on support in implementing Load Management (LM) measures at your buildings to optimize HVAC system efficiencies and find opportunities for energy savings. The **time commitment to course (TCC)** is **medium**.

Week 1 | Course Orientation

This session is dedicated to explaining the Load Management (LM) terms and concepts, Using Enertrac to interpret load profiles, identifying strategies to optimize energy consumption and identifying control loops. The participant learns how to use the HoboMobile and create a load profile baseline.

- 3.5 hours of online instruction

Week 2 | Building Automation System (BAS)

This session teaches students how to identify how to set up and extract trends data from a BAS system or data logger; and how to use trend data to better understand existing control loops.

- 1.45 hours of online instruction
- 1.45 hours of a coaching session

Week 3 | Interpreting Trend Charts

This session focuses on reading and interpreting trend charts for heating, shoulder, and cooling seasons.

- 1.45 hours of online instruction
- 1.45 hours of a coaching session

Week 4 to Week 8 | Coaching Sessions

These coaching sessions provide participants the opportunity to interpret and analyze facility-specific trend charts, investigate building systems, and, with the support of the instructor and DEM's Load Management Team, identify and implement operational improvements using specific best practices. During session 8, participants learn more about DEM funded programs from representatives, and next steps are established for post-class engagement with the Load Management team.

- 3.5 hours of a coaching session

Introduction to Load Management | Course Syllabus

This course is dedicated to identifying load management terms and concepts, navigating the EnerTrac software platform, and interpreting load profiles and consumption patterns to identify savings opportunities. The **time commitment to course (TCC)** is **low**.

- 7 hours of online instruction

Certified Energy Manager (CEM) | Course Syllabus

This course enables students to obtain the Certified Energy Manager (CEM) credential by preparing and registering them for the CEM certification exam, offered by the Association of Energy Engineers (AEE). The **time commitment to course (TCC)** is **high**.

Day 1 | Instruments

This session focuses on significant aspects of energy management and audit. The instructor reviews codes and standards and presents how to enhance a green building to high performance.

- 7 hours of online instruction

Day 2 | Accounting

This session presents energy accounting and economics, maintenance and commissioning, and M&V. The instructor also outlines practical aspects of the field, such as electrical power systems, motors, and drives, lighting systems.

- 7 hours of online instruction

Day 3 | Automation and Control

This session reviews characteristics of HVAC Systems, building envelope, automation, and control systems. The instructor offers an overview of thermal energy storage systems.

- 7 hours of online instruction

Day 4 | Energy Savings Performance

This session outlines industrial systems and energy savings performance contracting, measurement, and verification. The instructor reviews particular aspects of boilers, steam, and CHP systems.

- 7 hours of online instruction

Day 5 | Certification Exam

This session concludes the training and holds the proctored certification exam.

- certification exam // scheduling of exam (for the virtual training version)

Certified Energy Auditor (CEA) | Course Syllabus

This course enables students to take the Certified Energy Auditor (CEA) certification exam, which is offered by the Association of Energy Engineers (AEE). CEA operates as a standard for qualifying energy professionals in the United States and abroad; the CEA course is designed to provide participants with an in-depth, technical review of energy auditing. The **time commitment to course (TCC)** is **high**.

Day 1 | Energy Use Analysis

The session outlines how to develop an energy strategy through use analysis and data collection.

- 8 hours of online instruction

Day 2 | Economic Analysis

This session reviews significant aspects of energy auditing such as economic analysis, lighting, electrical, motors, and VDF's.

- 8 hours of online instruction

Day 3 | Building Envelope

This session focuses on reviewing building envelope, domestic hot water, and HVAC Systems.

- 8 hours of online instruction

Day 4 | Building Control Systems

This session focuses on building controls systems, alternative generation, energy storage, and transportation. This session also concludes the training and holds the proctored certification exam.

- 8 hours of online instruction
- certification exam / scheduling of exam (for the virtual version)

Certified Building Commissioning Professional (CBCP)

This course enables students to obtain the Certified Building Commissioning Professional (CBCP) credential by preparing and registering them for the CBCP certification exam, offered by the Association of Energy Engineers (AEE). The **time commitment to course (TCC)** is **high**.

Day 1 | Building Commissioning

This session overviews that traditional building commissioning approaches. The instructor outlines the differences between commissioning, testing, adjusting and balancing (TAB) and energy audit (EA), as well as the life-cycle building commissioning allies to pros and cons of the traditional approach.

- 8 hours of online instruction

Day 2 | Resources

This session focuses on the central resources of building commissioning guidelines and organizations. The instructor reviews the sustainability goals, as well as laws and regulations of this field.

- 8 hours of online instruction

Day 3 | Best Practices

This session introduces the best practices of retro-commissioning, process and phase approach. During this session, the instructor outlooks the fundamentals, tools, measurements and functional testing. In addition, the instructor oversees the commissioning software tools and Smart Building Commissioning.

- 8 hours of online instruction

Day 4 | Emphasis on Government Buildings

This session positions the best practices when working with government buildings and conducts a “brain-storm session” with all participants.

- 4 hours of online instruction
- Exam

About CUNY School of Professional Studies

The CUNY School of Professional Studies (CUNY SPS) provides online and on campus programs that meet the needs of adults who are looking to finish a bachelor's degree, earn a master's degree or certificate in a specialized field, advance in the workplace, or change careers.

Drawing on CUNY's nationally and internationally renowned faculty and practitioners, as well as industry and education partners, our programs provide opportunities for personal growth, job mobility, greater civic participation, and new ways to advance knowledge.

Contact: EMltraining@sps.cuny.edu

Location: CUNY School of Professional Studies, 119 West 31st Street, New York, NY, 10001

www.sps.cuny.edu

About CUNY Building Performance Lab

Founded in 2006, the mission of the CUNY Institute for Urban Systems Building Performance Lab is to advance high-performance building operations and practices in existing commercial and public buildings. We focus on improving efficiency and optimizing building operations through continuing education programs for facility managers, building operators, and energy professionals, internships for CUNY students, and building systems research and development. www.cunybpl.org

About DCAS Division of Energy Management

The New York City Department of Citywide Administrative Services' (DCAS) Division of Energy Management (DEM) serves as the hub for energy management for City government operations. As part of that role, DEM is charged with leading the City's efforts to reduce greenhouse gas (GHG) emissions, with the goal of an 80% reduction by 2050, across the City's built environment. DEM also manages a \$700 million annual energy supply budget and a \$2.7 billion 10-year capital budget to implement energy efficiency projects. Working closely with city agencies, DEM has focused on transforming energy management across the public portfolio of more than 4,000 public buildings by undertaking efforts in four areas: data analysis, behavioral change, energy-efficient operations and maintenance, and energy project implementation.

Today, DEM provides agency partners with nine major types of support to help them transform energy usage in their buildings: (1) Data Analysis (2) Technical Guidance, (3) Strategic Planning, (4) Dedicated Energy Management Staff, (5) Training and Behavioral Change Support, (6) Contracting Resources, (7) Enhanced Operations and Maintenance, (8) Funding for Energy Efficiency Projects, and (9) Funding for Clean Energy Generation Projects.

Contact: energy@dcas.nyc.gov or gguivelondo@dcas.nyc.gov

Location: Department of Citywide Administrative Services, Floor 17, Manhattan Municipal Building, 1 Centre Street, New York, NY 10007.

www.nyc.gov/energy-conservation

