DCAS Energy Management, in partnership with the City University of New York (CUNY) School of Professional Studies (SPS), CUNY Building Performance Lab (BPL) and the Citywide Training Center (CTC), is pleased to announce our schedule of courses for fall 2017.

We are also pleased to announce that we are launching two new courses in the fall: an overview course on the principles of measurement & verification for energy efficiency projects; and a course on Renewable Energy Technologies, with a focus on solar photovoltaic systems. Details for both of the new courses can be found in the catalog.

The goal of the Energy Management Institute (EMI) is to prepare city facilities personnel to make energy-smart decisions that will assist the City in meeting its greenhouse gas (GHG) emissions reductions goals.

The EMI is designed to help facility professionals across city agencies envision a learning path specifically targeted for them. Where do you stand on this learning path?
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>PAGE</th>
<th>COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Building Operator Certification (BOC) I</td>
</tr>
<tr>
<td>5</td>
<td>Building Operator Certification (BOC) II</td>
</tr>
<tr>
<td>7</td>
<td>Building Re-Tuning (BRT)</td>
</tr>
<tr>
<td>9</td>
<td>Measurement and Verification (M&amp;V)</td>
</tr>
</tbody>
</table>

**IMPORTANT:**

DCAS Energy Management (DEM) covers the cost of city staff participating in this training to improve the energy efficiency of building operations and maintenance, and to encourage building staff to develop, implement and monitor energy efficiency projects.

If a city employee registers for the course but drops out before satisfactory completion, a fee will be assessed to their agency's training department for "No Show" in accordance with the CTC cancellation policy. See course descriptions for respective fee amounts.
Course Description

Building Operator Certification (BOC) Level I serves as the gateway training program of the Energy Management Institute. It is designed to help building operators manage their facilities to become more energy efficient as part of the City's efforts to meet its greenhouse gas reduction goals.

The BOC Level I course is a competency-based training program that prepares participants with the tools necessary to increase the energy efficiency of City facilities while maintaining comfort for the building occupants. The course provides an overview of building systems including lighting, mechanical, and electrical systems and guidance to improve thermal comfort, air quality, and life-safety considerations.

The BOC Level I program offers a unique learning experience. Instruction is delivered both in a traditional classroom setting, as well as through self-paced, online modules via the Hughes Learning Management System.

The program is facilitated by CUNY Subject Matter Expert Instructors with deep experience and knowledge in engineering and the efficient operation of plants and equipment.

Course Overview

<table>
<thead>
<tr>
<th>Term:</th>
<th>Fall 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days:</td>
<td>Friday</td>
</tr>
<tr>
<td>Dates:</td>
<td>Sept 8, 22, Oct 6, 20, Nov 3, 17, Dec 1, 8, 15</td>
</tr>
<tr>
<td>Sessions:</td>
<td>9</td>
</tr>
<tr>
<td>Hours:</td>
<td>9 AM-4 PM</td>
</tr>
<tr>
<td>Locations:</td>
<td>Citywide Training Center, 1 Centre Street, 24th Floor South Tower</td>
</tr>
<tr>
<td>Code:</td>
<td>C7200</td>
</tr>
<tr>
<td>Registration Deadline:</td>
<td>August 7</td>
</tr>
</tbody>
</table>
Learning Objectives

At the conclusion of this program, participants will be able to:

- Apply knowledge of building mechanical and electrical systems—HVAC equipment and controls, electrical distribution, motors, and lighting—and how their operation relates to energy efficiency performance and building comfort conditions;
- Recognize system configurations, drawings of schematics, observation and interpretation of operating conditions;
- Develop strategies for systematic maintenance and performance monitoring.

Who Should Enroll

The course is designed for building operators who may have limited formal systems training, but have substantial work experience in building systems. This course is also beneficial to facility managers who have entered the field from a management background and seek to improve their understanding of physical and equipment principles.

Course Materials

On the first day of training, each participant will receive a course binder, textbooks published by the Building Operator Certification program and a copy of “Energy-Efficient Operation of Commercial Buildings: Redefining the Energy Manager’s Job” by Peter Herzog.

Grading & Practical Project

To earn the nationally recognized Building Operator Certification Level 1 credential, participants must:

- Attend and participate in the 9 in-class sessions,
- Satisfactorily complete the 14 on-line lessons,
- Take and pass 4 module specific exams,
- Submit 4 practical project assignments focused on applying concepts learned in class to the facilities where the participants work.

Video Prerequisites


Prep Courses

After registering, CUNY SPS will send the employee links to two mandatory skills assessments (Math and Microsoft Excel).

- Both assessments take about 15 minutes each to complete.
- Students’ scores will determine if they also need to take the online, self-paced prep courses prior to their BOC-Level I start date.

Elective Courses

- Communication Skills for Technical Professionals
- Outlook 2013 Level 1
- Writing Effective and Efficient E-mails

IMPORTANT CANCELLATION POLICY

If a City employee registers for a course, but drops out before satisfactory completion, a “No Show” fee of $1,875 will be assessed to their agency’s training department in accordance with CTC’s cancellation policy.
Course Description
For those who have completed BOC Level I, this advanced program provides an opportunity to deepen building performance skills, while working towards earning the BOC Level II credential.

This competency based program helps building operators and stationary engineers improve their job skills by teaching the tools necessary to increase building efficiency, improve occupant comfort and conduct energy efficient facility operations that meet the city’s greenhouse gas reduction goal.

This 14 week, 4 module course offers a blended learning format that includes:

- One (1) hour virtual webinars before the start of each module for participants to meet with their instructor to discuss the course content, projects, and ensure they are prepared to succeed in the program.
- Self-paced, online learning modules that support the content delivered in the classroom.
- Two (2) days of classroom instruction per module so participants can walk through the technical curriculum with CUNY Subject Matter Experts, as well as learn from peers at other City agencies.

Course Overview

<table>
<thead>
<tr>
<th>Term:</th>
<th>Fall 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days:</td>
<td>Friday</td>
</tr>
</tbody>
</table>
| Dates:    | Sept 15, 29  
            Oct 13, 27  
            Nov 3, 17  
            Dec 1, 15 |
| Sessions: | 8         |
| Hours:    | 9AM-4PM   |
| Locations:| Citywide  
            Training Center,  
            1 Centre Street,  
            24th Floor  
            South Tower |
| Code:     | C7200     |
| Registration Deadline: | August 14 |
Learning Objectives

At the conclusion of this program, participants will be able to:

- Collect facility operating data for monitoring and troubleshooting of operations;
- Identify sophisticated controls and control strategies;
- Identify, diagnose and correct control errors;
- Use energy data to maintain high levels of building performance;
- Select and apply maintenance strategies and techniques.

Who Should Enroll

Employees who have already earned the Building Operator Certification Level I (BOC I) credential at least one year prior to registering for BOC II.

Course Materials

On the first day of training, each participant will receive a course binder, a complete set of BOC Level II Handbooks, and additional study materials.

Grading & Practical Project

To earn the nationally recognized Building Operator Certification Level II credential, participants must:

- Attend and participate in the 8 in-classroom sessions,
- Satisfactorily complete the 14 on-line lessons,
- Take and pass 4 module specific exams,
- Submit 4 practical project assignments focused on applying concepts learned in class to the facilities where the participants work.

Prerequisites

BOC Level I Certification

Elective Courses

- Fundamentals of Supervision
- Communication Skills for Technical Professionals
- Writing Effective and Efficient Emails
- Building Positive Workplace Relationships

IMPORTANT CANCELLATION POLICY

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

**Building Re-Tuning (BRT)** training is designed to give building operators advanced training in analysis of facility operations to further identify efficiency improvements.

The BRT course is offered as 5 in-class sessions that include integrated project-based work that is completed by participants in between classroom meetings. The course is aimed at operators and managers with previous energy management training (BOC Level 1 and/or BOC Level 2, Certified Energy Manager, etc.).

BRT is designed to teach participants the skills that are needed to conduct a re-tuning of facilities that use a BAS/BMS system. The course is designed to walk participants through the BRT process from foundational concepts through an initial BRT tune-up. BRT training requires hands-on implementation practice in the participants’ facilities.

**NOTE:** Participants must be able to access trend logging functions in a BAS/BMS.
Learning Objectives

At the conclusion of this program, participants will be able to:

- Explain the overall BRT process from start to finish
- Identify how BRT protocol relates to retro-commissioning and continuous commissioning concepts/practices.
- Create trend logs using BAS data collection function.
- Create graphic displays from BAS/BMS data using basic methodologies.
- Interpret graphical trend data for diagnostics and identification of energy reduction/optimization opportunities.

Who Should Enroll

This course is designed for building operators with previous energy efficiency/energy management training. It is also beneficial to facility managers who have entered the field from a management background and seek to gain skills in data-driven facility diagnostics. Participants should have a working knowledge of energy efficiency in building systems and the ability to access trend log functions in their facility’s BAS/BMS.

Course Materials

Each participant will receive a course handbook based on materials from the Pacific Northwest National Lab and access to on-line study materials. The field project component will be conducted over the course of the 5-week program.

*CUNY student engineering interns will be available to assist with various aspects of the project, especially related to new graphing software applications.*

Grading & Practical Project

Participants will be evaluated based on their ability to conduct an initial BRT project, using BAS/BMS data, in discrete steps during the five weeks of the course.

---

**Prerequisites**

- BOC Level I Credential

**Video Prerequisites**


**Elective Courses**

- Communication Skills for
- Technical Professionals
- Outlook 2013 Level 1
- Writing Effective and Efficient
- E-mails

---

**IMPORTANT CANCELLATION POLICY**

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

DCAS Energy Management (DEM), in partnership with the City University of New York (CUNY) School of Professional Studies (SPS) and the CUNY Building Performance Lab (BPL), has developed a new program for city employees to be trained in the process of measurement and verification (M&V) for energy efficiency projects.

DEM has several programs in place that fund capital and expense energy efficiency projects, and in order to ensure that these projects are delivering energy and greenhouse gas emissions savings, verifying the savings through a measurement and verification (M&V) process is critical part of the project. This new M&V course will introduce participants to the basics of M&V.

<table>
<thead>
<tr>
<th>Course Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term:</td>
</tr>
<tr>
<td>Days:</td>
</tr>
<tr>
<td>Dates:</td>
</tr>
<tr>
<td>Sessions:</td>
</tr>
<tr>
<td>Hours:</td>
</tr>
<tr>
<td>Locations:</td>
</tr>
<tr>
<td>Code:</td>
</tr>
<tr>
<td>Registration Deadline:</td>
</tr>
</tbody>
</table>
Learning Objectives
At the conclusion of this course, participants will be able to:

- Identify basic terminology and concepts of measurement and verification and energy efficiency.
- Identify the most common types of variables measured in M&V projects.
- Identify the key tools used to measure and verify ECM performance.
- Identify the elements of an M&V plan and the M&V planning process as applicable to DCAS Energy Management programs.
- Prepare and present an M&V project.

Who Should Enroll
This course is designed for city personnel responsible for some level of energy conservation and implementing energy efficiency projects including: Energy Managers, Energy Analysts, Energy Liaisons, Senior Stationary Engineers, Design Engineers, Custodial Engineers and others who propose ECMS, manage the installation of ECMS, and/or are responsible for verifying the impact of ECMS once implemented.

Course Materials
Learning materials will be provided to participants on the first day of training.

Grading & Practical Project
Participants will be evaluated based on their ability to prepare and present an M & V plan according to course guidelines.

<table>
<thead>
<tr>
<th>Video Prerequisites</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Prep Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>After registering, CUNY SPS will send the employee links to two mandatory skills assessments (Math and Microsoft Excel).</td>
</tr>
<tr>
<td>- Both assessments take about 15 minutes each to complete.</td>
</tr>
<tr>
<td>- Students’ scores will determine if they also need to take the online, self-paced prep courses prior to their M&amp;V class start date.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elective Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Communication Skills for Technical Professionals</td>
</tr>
<tr>
<td>- Outlook 2013 Level 1</td>
</tr>
<tr>
<td>- Writing Effective and Efficient E-mails</td>
</tr>
</tbody>
</table>

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

DEM has partnered with the NY Sun PV Trainers Network (PVTN) and New York City College of Technology Division of Continuing Education to develop Renewable Energy 101: Fundamentals in Solar PV for City of New York employees involved with renewable energy project site selection, implementation, system operation and maintenance.

This program targets a broad audience that includes:

- Facilities Managers, Construction Project Managers, Energy Managers, and other key decision makers
- Trades staff and Building Operators (Electricians, Plumbers, Oilers, Custodial Engineers, Maintenance Workers)
- Other interested stakeholders, such as Capital Planning staff, Sustainability staff and IT Personnel

Renewable Energy 101: Fundamentals in Solar PV incorporates a blended teaching approach that includes both in-person classroom and an interactive hands-on lab.

Course Overview

| Term:    | Fall 2017 |
| Days:    | Tues/Wed/Thurs/Fri |
| Dates:   | Dec 5, 6, 7, 8 |
| Sessions:| 4 |
| Hours:   | 9AM-3PM (Days 1-3) 9AM-5PM (Day 4) |
| Locations: | **Lecture:** CUNY School of Professional Studies 119 W. 31 Street 4th Floor (12/5-12/7) |
|          | **Hands-On Lab:** City Tech College 25 Chapels Street Howard 4th Fl. (12/8) |
| Code:    | TBA |
| Registration Deadline: | October 20 |
Learning Objectives

At the conclusion of this program, participants will be able to:

- Identify the benefits and most appropriate applications for renewable energy technologies
- Demonstrate in-depth knowledge of solar photovoltaics, including: site selection, installation basics, operations and maintenance and other relevant content to facilitate the execution and ensure the longevity of renewable energy projects.

Who Should Enroll

City of New York Facilities Managers, Directors, Construction Project Managers, Energy Managers, Engineers, Trades staff, Building Operators and other stakeholders responsible directly or indirectly with renewable energy project implementation, operations and maintenance.

Course Materials

Selected materials will be provided to the participants during each training day.

What is the SUN PV Trainer’s Network?

NYSERDA’s NY-Sun PV Trainers Network (PVTN) is a consortium of nine organizations led by Meister Consultants Group, Sustainable CUNY, and Entech Engineering that provides training and education on solar photovoltaics (PV) to municipal officials across New York State.

The network's trainings include Safety and Fire Considerations for Solar PV, Solar PV Permitting and Inspection Methods, Solar PV for Engineers and Architects, Introduction to Solar, Creating and Implementing Your Solarize Campaign, Expanding Commercial Solar with a Pace Program, Introduction to Community Distributed Generation: Shared Solar, Land Use Planning for Solar Energy, and Zoning for Solar Energy. PVTN has also developed a set of dedicated resources including guidance documents, factsheets, webinars and podcasts on various solar related topics. Since September of 2014, PVTN has conducted over 180 trainings and trained close to 6,000 municipal officials across New York.

The PVTN looks forward to bringing its expertise and experience to providing a tailored course for New York City's employees on solar PV.

New York City College of Technology
Division of Continuing Education

The Division of Continuing Education and External Partnerships is committed to creating pathways to higher education, job training and professional development programs as well as personal enrichment opportunities for our community. By serving a diverse population of learners, we help meet the economic and workforce development needs of the evolving New York City workplace as we promote and encourage lifelong learning.

Prerequisites

Available via the DCAS DEM website:

Advice from NYC’s Operations & Maintenance Champions:

NY-Sun PVTN Training Resources

IMPORTANT CANCELLATION POLICY

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