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 spring 2018.

New for spring is the launch of two new courses: an introductory course on buildings systems (Fundamentals of Building Systems) and building retuning for buildings that do not have a BAS/BMS (noBAS BRT). 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 reduction goals.

The EMI is designed to help facility professionals across city agencies envision a learning path specifically targeted to them. Where do you stand on this learning path?
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**IMPORTANT:**

DCAS Energy Management (DEM) covers the cost of New York 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.

- Attendance: City employees participating in EMI programs are expected to attend all scheduled sessions for their program and arrive by the scheduled start time. Excessive lateness or absences will result in the employee being dropped from the program and their agency being assessed a “No Show” fee.
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-1 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-1 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

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<td>Day(s):</td>
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| Date(s):     | Jan 12, 26  
               Feb 9, 23 
               March 9, 16 
               April 6, 20, 27 
               May 11        |
| Sessions:    | 9 Classroom   |
|              | 2 Webinars: (1/12, 3/16) |
| Hours:       | 9:00am-4:00pm (Class)   |
|              | 10:00am-11:00am (Webinar) |
| Location(s): | Citywide Training Center |
|              | 1 Centre Street |
|              | 24th Floor, South Tower |
| Code:        | TBA           |
| Registration Deadline: | December 29 |
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 governing body (NEEC) 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 Training Certificate of Completion, credential, participants must:

- Attend and participate in the 9 in-class sessions,
- Attend and participate in the 2 online webinars,
- 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 they work.

Video Prerequisites
Available via the DCAS DEM website:

“This is DEM”

“Advice from NYC’s Operations & Maintenance Champions”:

Available via YouTube:
https://www.youtube.com/user/dcasnyc

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-1 class 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-1, this advanced program provides an opportunity to deepen building performance skills, while working towards earning the BOC-2 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

| Term: | Spring |
| Day(s): | Friday |
| Date(s): | Jan 19<br>Feb 2, 16, 23<br>March 2, 16, 23<br>April 6, 20, 27<br>May 4, 18 |
| Sessions: | 8 Classroom<br>4 Webinars: (1/19, 2/23, 3/23, 4/27) |
| Hours: | 9:00am-4:00pm: (Class)<br>10:00am-11:00am: (Webinar) |
| Location(s): | Citywide Training Center<br>1 Centre Street<br>24th Floor, South Tower |
| Code: | TBA |
| Registration Deadline: | December 29 |
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 earned the Building Operator Certification Level I (BOC-1) Training Certificate of Completion credential at least 1 year prior to registering for BOC-2.

Course Materials

On the first day of training, each participant will receive a course binder, a complete set of BOC-2 Handbooks, and additional study materials.

Grading & Practical Project

To earn the nationally recognized Building Operator Certification Level II (BOC-2) Training Certificate of Completion credential, participants must:

- Attend and participate in the 8 in-class sessions.
- Attend and participate in the 4 online webinars.
- 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.

Program Prerequisites

BOC-1 Training Certificate of Completion Credential

Video Prerequisites

Available via the DCAS DEM website:
“This is DEM”

Available via YouTube:
https://www.youtube.com/user/dcasnyc

Elective Courses

- Fundamentals of Supervision
- Communication Skills for Technical Professionals
- Writing Effective & 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-1 and/or BOC-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 walks participants through the BRT process from foundational concepts through an initial BRT tune-up. BRT training requires hands-on implementation practice in their facility.

NOTE: Participants must have access to an agency building and be able to access trend logging functions in a BAS/BMS.

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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 binder 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 engineering student interns will be available to assist with various aspects of the project, e.g. 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 5 weeks of the course.

**Program Prerequisites**

BOC Level I Credential

**Video Prerequisites**

Available via the DCAS DEM website:

“This is DEM”

“Advice from NYC’s Operations & Maintenance Champions”:

Available via YouTube:
https://www.youtube.com/user/dcasnyc

**Elective Courses**

• Communication Skills for Technical Professionals
• Outlook 2013 Level 1
• Writing Effective & 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

Building Re-Tuning without Building Automation System (noBAS BRT) is a new course designed to give building operators advanced training in analysis of facility operations to further identify efficiency improvements. The noBAS BRT course is offered in five (5) in-class sessions. It covers five (5) measures/systems of interest related to fan operation and outdoor supply.

**Topics include:**
- HVAC Zone Temperature
- Fan Operation Times
- Outdoor Air (OA) Control
- Discharge Air Temperature Hunting & OA Damper Minimum Position

The noBAS BRT course is designed to teach participants the skills needed to conduct re-tuning of facilities that do not use a BAS/BMS system. Participants learn to identify inefficiencies and appropriate operation improvements. Integrated project-based assignments are completed by participants in between classroom meetings.

**Note:** Participants must have access to an agency building to attend this course.

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Learning Objectives

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

- State the Building Re-Tuning process, its objectives and its implementation.
- Identify systems for re-tuning and the associated data requirements.
- Set-up trend logs and graphical representations.
- Interpret graphical representations to diagnose common system operating faults.
- Begin the thinking and planning for a long-term building operations improvement process.

Who Should Enroll

This course is aimed at operators and managers with previous energy management training (i.e. BOC-1 and/or BOC-2, Certified Energy Manager, etc.) 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 their agencies buildings.

Course Materials

Each participant will receive a course binder based on materials from the CUNY Building Performance Lab. The field project component will be conducted over the course of the 5-week program.

*CUNY engineering student interns will be available to assist with various aspects of the project.*

Grading and Practical Project

Participants will be evaluated based on their ability to conduct an initial BRT project, without the aid of a BAS/BMS.
Course Description

Fundamentals of Building Systems is a new program that provides foundational industry knowledge pertaining to building systems, vocabulary, concepts, and the goals of energy efficiency in municipal building operations within the City of New York. This course also prepares students interested in furthering their energy management training to succeed in the next program in the series: Building Operator Certification Level I (BOC-1).

Fundamentals of Building Systems is a blended learning course. It consists of a half-day classroom Introduction session, ten (10) self-paced online learning modules, and a half-day classroom Wrap-Up session.

Topics include:
- Building Envelope
- Science of Building Systems
- HVAC, Plumbing and Electrical Building Systems
- Building Controls
- Codes, Zones and Regulatory Requirements
- Management and Maintenance
- Occupant Controls
- Risks
- Environmental Factors

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

- Identify the regulatory mandates driving municipal energy efficiency initiatives.
- Comprehend building operations systems including their relationship to overall energy consumption.
- Introduce essential scientific knowledge on electrical and mechanical engineering that pertain to building operations.
- Identify best practices for energy efficiency in municipal buildings.
- Define common terms and concepts used in building operations management.
- Demonstrate comprehension of the knowledge base needed to enter the BOC-1 program.

Who Should Enroll
This course is designed for non-building operators (i.e., Energy Managers, Energy Analysts and other administrative personnel) without previous energy efficiency/energy management training. Participants in this course should not have the primary job responsibility for managing the building operations in their facility.

Fundamentals of Building Systems is also the prerequisite for non-building operators who seek to complete the BOC-1 program.

Course Materials
Each participant will receive access to the Hughes Learning Management System to access the ten (10) on-line modules for this course.

Grading
Pre and post learning assessments will be administered to assess how much participants have learned by attending the classroom sessions and completing the on-line modules.
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 process is a critical part of the project. This new M&V course will introduce participants to the basics of M&V.

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<td><strong>Dates:</strong> Mar 7, 28 (Classroom)</td>
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<td>Mar 14 (Webinar)</td>
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<td><strong>Sessions:</strong> 2 Classes 1 Webinar</td>
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<td><strong>Hours:</strong> 9:00am-3:00pm (Class)</td>
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<td><strong>Locations:</strong> CUNY SPS 119</td>
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<td><strong>Registration Deadline:</strong> February 2</td>
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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 the course guidelines.

Video Prerequisites

Available via the DCAS DEM website:
“This is DEM”

Available via YouTube:
https://www.youtube.com/user/dcasnyc

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 M&V class 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

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 classes and an interactive hands-on lab.

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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 City 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 to meet the economic and workforce development needs of the evolving New York City workplace, as we promote and encourage lifelong learning.

Video Prerequisites
Available via the DCAS DEM website:
“This is DEM”

Available via YouTube:
https://www.youtube.com/user/dcasnyc

Available via the NY-Sun PVTN website:
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.