



Course Number: BOC 400

Course Title: Fundamentals of Energy Efficient Building Operations

Course Hours: 18

Course Description

Launch your career in facilities with a strong understanding of energy efficient techniques and practices in commercial buildings. This three-day training is targeted toward facilities personnel that are new to building operations as well as staff members that are not directly involved in equipment maintenance, particularly in management / supervisory roles. Utilizing core Building Operator Certification (BOC) concepts, this training focuses on efficient operations and strengthens building optimization skills. The training is intended to complement other on-the-job training and experience and to provide a general awareness of building operations fundamentals from an energy efficiency perspective.

The key purpose of the training is to increase energy efficiency awareness and develop core BOC skills in an introductory manner. The course highlights concepts of sustainable operations and the important role that building operators play in efficient buildings. An overview of basic building equipment including HVAC, lighting, and controls is included. Through learning activities, the student understands the importance of measuring and benchmarking energy performance and their role in their organization's energy and financial goals. The course also covers the fundamentals of indoor environmental quality and the link between productivity and building operations. The students will leave with a key understanding of the importance of their role in efficient operations, customer service, and organizational productivity.

Prerequisites

None

Required textbook/materials

The following textbooks/materials are required for successful completion of this course:

- Fundamentals of Energy Efficient Building Operations Parts 1 & 2 Handbook Edition 2.00

- Fundamentals of Energy Efficient Building Operations Parts 3 & 4 Handbook Edition 2.00
- Fundamentals of Energy Efficient Building Operations Parts 5, 6 & 7 Handbook Edition 2.00

Course Rationale

- Trained and motivated building technicians can reduce utility costs at facilities by at least 5 to 15 percent. One of the key jobs to ensure energy efficiency in buildings is through building maintenance and operations. This requires in-depth training from an established program that has proven success.

Instructional Strategies

This course may employ the following instructional strategies to present information:

- Lectures
- Demonstrations
- Small group exercises and “report outs”
- Q&A sessions
- Questions are always encouraged

Learning Objectives

Upon completion of this course, participants will be able to:

- Achieve general awareness of facilities and instilled efficiency ethic
- Introduce BOC concepts
- Strengthen building optimization skills
- Identify areas for energy savings
- Make energy-smart decisions in day-to-day tasks

Course Outline

The course is organized into 7 distinct modules that cover various topics, all related to the overall objectives. The parts/modules and their learning objectives are:

Part 1: Energy Efficiency and Sustainability Overview

- Program Overview
- Concepts of green and high-performance buildings
- Trends in Building Operations
- Energy Efficient Operations and Maintenance (First section of Part 2)
- *Learning activity: Developing your facility’s baseline and goals*

Part 2: HVAC Fundamentals

- Introduction to HVAC
- Heating & Cooling Systems
- Air Systems
- *Learning Activity: Identify equipment from a sketch*

Part 3: Lighting Fundamentals

- Lighting Principles
- Lighting Equipment
- *Learning Activity – Using a Light Meter*
- Lighting Maintenance
- Lighting Efficiency

Part 4: Energy Conservation Opportunities

- Energy Conservation and Facility Management
- Common Opportunities for Low-Cost Operational Improvement
- *Learning Activity: Energy Conservation Opportunities*
- Introduction to Controls

Part 5: Indoor Environmental Quality

- Indoor Environmental Quality Overview
- Effective Communication
- *Learning Activity: Communications Case Study*
- Fundamentals of Indoor Environmental Quality
- Preventing IEQ Problems
- Pollutant Control Strategies

Part 6: Measuring and Benchmarking Energy Performance

- Energy Management
- Energy Fundamentals
- Energy Accounting
- *Learning Activity – Interpreting Energy Bills*

Part 7: Conclusion: Putting It All Together

- Engaging with customers
- Monitoring and measuring
- Building a plan for your facility

Course Structure

This course will be held in a live, instructor-led virtual classroom over the course of three days, six hours each day.

Note: The instructor reserves the right to modify content at any time with timely notification to enrolled participants.

Grading System and Procedures

A course completion certificate will be issued to learners that meet the attendance requirements, and receive a score of 70% or higher on the comprehensive, open-book final exam. Students are required to attend a minimum of five classes. Participation in class discussions and group exercises is highly encouraged.

Need for accommodations

If a student has need for specific accommodations to complete the course, please contact our training center at 570-327-4768 or cleanenergy@pct.edu.

Course Policies and Procedures

Location:

TBD based on client preference

Clean Energy Center Office Hours:

8 a.m. to 4:30 p.m. daily

Phone: 570-327-4768

E-mail: cleanenergy@pct.edu