

Advanced Building Controls Course Outline and Curriculum **A New Resource for DoD Energy Managers and Building Operators**

The training topics for **energy managers** cover four modules and a total of **17 high-level**, short courses (about 15 minutes each):

1. Fundamentals of Building Control Systems

- Introduction to Building Automation System Architecture
- BACnet, LonWorks, and Niagara Framework
- Basics of HVAC Controls - Components
- Basics of HVAC Controls - Control Loops

2. Advanced Control Strategies

- Energy Savings of Advanced Controls
- Introduction to Optimal Scheduling
- Introduction to AHU Supply Air Temperature and Pressure Resets
- Introduction to Economizers
- Introduction to Demand-Controlled Ventilation
- ASHRAE Guideline 36: Overview, Benefits, and Field Demonstration
- ASHRAE Guideline 36: What It Covers

3. Energy Modeling, Intelligent Building Operation, and Advanced Energy Performance

- Building Energy Modeling 101
- Smart Building Operations through Optimal Control and Energy Performance Monitoring

4. ESTCP Technology Demonstration Projects

- Demonstration of Tiered Trim and Response Method
- Energy Performance Monitoring and Optimization System for DoD Campus
- Scalable Deployment of Advanced Building Energy Management Systems
- Multi-Zone Unit Control

The training topics for **engineers** and **building operators** will cover five modules and a total of **21 in-depth courses** (about 1-hour each).

1. Fundamentals of Building Control Systems

- Basic HVAC Equipment and Systems
- Basic HVAC Controls
- Building Control System Design
- Building Control Project Implementation
- Utility Monitoring and Control System Front End and Integration

2. Advanced Control Strategies

- Introduction to Optimal Scheduling
- Introduction to AHU Supply Air Pressure and Temperature Resets
- Introduction to Economizers
- Introduction to Demand-Controlled Ventilation

- Cost-Benefit Analysis
- ASHRAE Guideline 36: Field Demonstration
- Introduction to ASHRAE Guideline 36
- 3. Energy Modeling, Intelligent Building Operation, and Advanced Energy Performance**
 - Building Energy Modeling 101
 - Smart Building Operations through Optimal Control and Energy Performance Monitoring
 - Building Monitoring, Data analysis, and Troubleshooting
- 4. ESTCP Technology Demonstration Projects**
 - Demonstration of Tiered Trim and Respond Method
 - Energy Performance Monitoring and Optimization System for DoD Campuses
 - Scalable Deployment of Advanced Building Energy Management Systems
 - Multizone To Variable Volume Control Retrofit
- 5. Existing Building Commissioning**
 - Overview of Building Re-tuning: Using Analytics to Improve Building Operations
 - Building Operation and Continuous Commissioning

Signup on Slipstream's webpage to access courses:

<https://slipstreaminc.org/estcp>

