International Union of Operating Engineers

AFFILIATED WITH THE AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS

Stationary (NTF) Training Course Schedule

Courses from July 5, 2025 - September 3, 2025

Course - Session	Date(s)
Automated Lighting Controls by Lutron Electronics	Jul 7, 2025 - Jul 8, 2025
OSHA 503 Update for General Industry Outreach Trainers	Jul 7, 2025 - Jul 9, 2025
Electrical Systems 1	Jul 9, 2025 - Jul 13, 2025
OSHA 502 Update for Construction	Jul 10, 2025 - Jul 12, 2025
Pump Maintenance & Operation	Jul 14, 2025 - Jul 17, 2025
HVAC Systems 2	Jul 14, 2025 - Jul 18, 2025
Data Center Operations	Jul 14, 2025 - Jul 18, 2025
OSHA 521 Industrial Hygiene	Jul 14, 2025 - Jul 18, 2025
Boiler Operations 1	Jul 17, 2025 - Jul 21, 2025
NATE Test Prep	Jul 20, 2025 - Jul 22, 2025
Electrical Systems 2	Jul 21, 2025 - Jul 25, 2025
Basic Controls and Building Automation Systems	Jul 26, 2025 - Jul 28, 2025
Energy Conservation	Jul 26, 2025 - Jul 29, 2025
Electrical Troubleshooting & Variable Frequency Drive Operations	Aug 1, 2025 - Aug 4, 2025
Chiller Efficiency	Aug 2, 2025 - Aug 4, 2025
Advanced Controls & Building Automation Systems	Aug 2, 2025 - Aug 4, 2025
Data Center Operations	Aug 5, 2025 - Aug 9, 2025
Stationary Training Conference	Aug 5, 2025 - Aug 6, 2025
High Pressure Boiler Operations	Aug 6, 2025 - Aug 10, 2025

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Electrical Systems 2	Aug 11, 2025 - Aug 15, 2025
Pump Maintenance & Operation	Aug 11, 2025 - Aug 14, 2025
Welding	Aug 11, 2025 - Aug 15, 2025
Rooftop Unit Maintenance & HVAC Troubleshooting	Aug 17, 2025 - Aug 20, 2025
Solar Panel Installation Maintenance & Troubleshooting	Aug 19, 2025 - Aug 22, 2025
Chief Engineer Course	Aug 22, 2025 - Aug 26, 2025
Electrical Systems 1	Aug 25, 2025 - Aug 29, 2025

Training Course Descriptions

AUTOMATED LIGHTING CONTROLS BY LUTRON ELECTRONICS

For Stationary engineers who wish to gain a better understanding of networked lighting control systems along with how to maintain and troubleshoot them.

Lutron's founder, Joel Spira, invented the first solid state electronic dimmer in 1959. Fast forward to the present day and the world of lighting controls has greatly advanced. In this class you will learn about the most popular commercial Lutron systems installed over the past decade. These products are found in hundreds of thousands of buildings across North America and the world. Commercial lighting systems will often fall under the purview of facilities management so a firm understanding of their maintenance ensures that the lighting system runs as smoothly as the rest of the building.

The duration of this course will be two days. It will act as a knowledge primer for the variety of commercial legacy Lutron systems a stationary engineer may find. We will also introduce the future of Lutron lighting controls and our newest commercial system.

Detailed topics will include:

- Online prerequisite learning plan introducing dimming technology and the Lutron story
- Instructor-led presentations relating to legacy Grafik Eye QS, Energi Savr Node, and panels
- Overview of Lutron's Vive and Quantum systems
- How to control the Quantum Vue Facilities Management software and use it in troubleshooting
- Work on a live Quantum system test wall, program and introduce faults in real-time
- Introduction to Lutron's newest cloud-connected solution, Athena
- Best Practices for Asset Management and Planning
- Update on Fluorescent to LED retrofit kits
- Tour of IUOE's Quantum Lighting Control System and software

OSHA 503 UPDATE FOR GENERAL INDUSTRY OUTREACH TRAINERS

OPEN TO IUOE INSTRUCTORS ONLY

RE-AUTHORIZES INSTRUCTOR TO TEACH: 10- and 30-Hour General Industry Outreach courses.

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Stationary (NTF) Training Course Schedule

ELECTRICAL SYSTEMS 1

Electricity is a fundamental part of most tasks that the stationary engineer performs. Whether one works with motors, chillers, boilers, air handlers, lighting, or controls, electricity plays a part of each. This course equips the stationary engineer with knowledge of electrical principals, electrical safety, how to perform electrical calculations, and gives an understanding of both AC and DC electrical components. Students have the opportunity to also perform hands on activities to reinforce the coursework.

This course is a suggested pre-requisite for Electrical Systems 2 course.

OSHA 502 UPDATE FOR CONSTRUCTION

OPEN TO IUOE INSTRUCTORS ONLY.

RE-AUTHORIZES INSTRUCTOR TO TEACH: 10- and 30-Hour Construction Industry Outreach courses.

PUMP MAINTENANCE & OPERATION

Successful and efficient operations and maintenance of any mechanical system can only be accomplished with a clear understanding of the components making up the mechanical system and how they interact. Stationary engineers are responsible for the operations and maintenance of the Chilled Water, Condenser Water and Hot Water systems to just name a few. The heart of each of these is the pump.

In this four-day course students will become familiar with different types of pumps, their operating principles, how to diagnose and troubleshoot issues, and their proper maintenance and repair procedures. Focus is on hands on activities.

HVAC SYSTEMS 2

HVAC Systems 2 builds upon the students fundamental knowledge of heating, ventilation and air conditioning principles to teach the safe and efficient operation of systems found in facilities. Students completing the class will gain the following:

- Understanding of the operation of chillers, heat exchangers, pumps, fans and other system equipment.

- Understanding of the interaction between the different components in a system
- Understanding of HVAC control systems.
- Ability to perform basic HVAC system troubleshooting.
- Ability to safely handle refrigerants.
- Participate in practical hands on exercises to reinforce learning outcomes.
- Ability to pass a basic HVAC competency exam.
- Opportunity to take the EPA 608 exams.

Students taking HVAC Systems 2 should have previously taken HVAC Systems 1, or have knowledge of system components and core HVAC principles.

DATA CENTER OPERATIONS

Data Center Operation is a core skill for Operating engineers. This course will introduce the student to Data Center equipment found in mission-critical facilities where power supply and environmental control interruption is not acceptable. The program will cover an overview of the Data Center safety guidelines (OSHA 10, NFPA 70e), basic electrical theory and power distribution, switch gear operation, emergency generators, manual & automatic transfer switches, Uninterruptible Power Systems (UPS), battery types and handling procedures, Data Center specific HVAC equipment, chilled water systems, rules governing work in a Data Center, airflow management, fire risk mitigation and suppression, and general techniques used in these facilities. This will also include hands on exercises in our classroom Data Center simulation.

OSHA 521 INDUSTRIAL HYGIENE

OPEN TO IUOE INSTRUCTORS ONLY

AUTHORIZES INSTRUCTOR TO TEACH: Respiratory protection as a standalone course or as part of other courses, such as HAZWOPER.

MAIN TOPICS COVERED: Topics covered include terminology, OSHA Standards, NIOSH certification, respiratory protection programs, and medical evaluation recommendations.

BOILER OPERATIONS 1

The Boiler Operation 1 course is an introductory course that will provide stationary engineers and maintenance personnel a foundational understanding of boilers, steam and heating. Students will learn how boiler systems work, gain an understanding of boiler safety and learn about various boiler fittings and accessories. Upon completing the class, students will understand basic heat and steam principles, and know how to safely perform an inspection of an operating boiler.

NATE TEST PREP

North American Technician Excellence (NATE) is a non-profit certification organization for HVAC-R technicians. The ITEC is an official NATE Testing Organization.

The NATE Prep is offered at the ITEC is designed for journey level engineers who have knowledge of fundamental electrical, HVAC and refrigeration principles, as well as practical field experience. The 3-Day prep session will review electrical theory, safety, circuits, troubleshooting and formulas. The session will also review HVAC system components, system operations and maintenance, system controls, refrigeration principles and air conditioning troubleshooting. The review will assist students to take the NATE "Core" and "Air Conditioning and Heat Pumps" certification tests. Both tests will be administered during the 3-day session and students must pass both tests to achieve NATE certification. Information about NATE tests and the purchase of study guides can be found at natex.org. (https://natex.org/)

It is recommended to have and review both study guides prior to the session.

Core - NATE (natex.org) Air Conditioning and Heat Pumps - NATE (natex.org)

There is $140 fee to be paid by the student for each test. (Test pricing subject to change per NATE)

ELECTRICAL SYSTEMS 2

This class builds off of Electrical Systems 1 so students should have taken that before this class or have comparable experience and understanding.

In this class, students will be provided a greater understanding of electrical principles and theory including series and parallel circuits and more advanced electric formulas. Students will gain the ability to read electrical prints, replace breakers, and perform troubleshooting using Fluke meters. This course includes substantial hands-on activities.

BASIC CONTROLS AND BUILDING AUTOMATION SYSTEMS

BASIC CONTROLS& BUILDING AUTOMATION SYSTEMS

This course has been developed for individuals who want to take the mystery out of the understanding of how DDC controls and Building Automation Systems operate, and also the

insight of the various related software packages that drive these systems and how they manipulate these systems.

This seminar has also been designed for people not familiar DDC controls and Building Automation Systems. There will be lectures on basic control strategies, the basics of DDC hardware, and also the basic understanding of building optimization for curtailing the use of energy.

For the experienced people there will be discussions on advanced control technologies dealing with the architecture of Building Automation Systems, discussing how they are installed, wired, and then programmed. Also, there will be main topic lectures on DDC Main Controllers, Stand alone controllers, and there communication protocols.

After the completion of this seminar the participants will be able to:

- Understand the basic DDC and Analog control technology for the HVAC field
- Describe the different types of control actions and when to use them
- Identify Building Automation System main components and where they are used
- Define and select the proper Automation System for different locations
- Ascertain how Building Automation Systems Operate to maintain human comfort
- Define the different types of Analog and Binary inputs and outputs
- Understand the system wiring though various schematic diagrams of installed systems
- Comprehend the different type of operator interfaces and how they communicate
- Define criteria for control strategies such as with closed loop control
- Describe control strategies and how buildings are optimized for peak efficiency
- Understand how a PID loop is written and how to tweak it in for the maximum performance
- Define the different types of programming method

ENERGY CONSERVATION

Prerequisite: Students should have strong working knowledge of Electrical systems, HVAC systems and Building Automation systems.

Members of the International Union of Operating Engineers manage a large amount of the energy that is consumed in North America. Our involvement in this energy management endeavor is critical to its success. This course will explain the various aspects of energy management, metering, regulations, standards, energy auditing, and energy management solutions.

Please see course commercial: iuoentf.training/videos/energy-conservation.mp4

This is a lecture-based course:

Course Overview:

- Introduction to Energy Conservation
- The Energy Star Program and Energy Benchmarking
- The US Green Building Council and LEED
- Effective Energy Management
- Metering and Monitoring
- Energy Unit Conversions
- Energy Audits and Assessments
- Energy Conservation Opportunities
- Energy Bills
- Calculating Energy Savings
- Energy Cost Calculations Workshop
- The Building Envelope

- Boilers and Combustion Devices
- Steam and Condensate Systems
- HVAC Systems
- Electric Energy Management
- Lighting
- Building Automation Systems
- Waste Heat Recovery
- Lesson 19: Advanced Technologies
- Building Commissioning
- Project Management

ELECTRICAL TROUBLESHOOTING & VARIABLE FREQUENCY DRIVE OPERATIONS

This four-day seminar is designed to provide the knowledge and skills required when selecting, installing, testing and troubleshooting electrical systems the motors they control, and the control circuits connected to them. In this hands-on seminar, students will build, program and test VFD, motors and control circuits.

Test instruments covered and used include digital multi-meters (DMMs), current clamps and meter attachments. Topics, circuits, and equipment covered include:

• Test instrument terminology, symbols and measurement functions for each type of instrument used is covered to learn what test instruments should and should not be used circuits.

• Learn the safe and correct way to take electrical measurements and what the measurements actually mean.

.• Learn where and how to use special meter functions like MIN/MAX, RELATIVE, LoZ, Peak, kVA,

kW, and PF measurement functions.

• Learn how to test for grounding problems.

• Understanding VFD and motor nameplate data.

• Learn how to test and wire any three-phase motor without using the motors wiring diagram and what the expected readings should be before power is applied and how to troubleshoot the motor after power is applied.

• Circuits built include using, magnetic motor starters, mechanical and solid-state switches, such as, selector switches, proximity switches, photoelectric switches, analog inputs (photovoltaic and potentiometers), and other commonly used electrical devices.

• Connect, program, and test VFDs (variable frequency drives).

• Take power measurements (P.F., kVA, kW, and harmonic) to understand power quality problems.

CHILLER EFFICIENCY

Chillers can be one of the largest energy users in a facility. This seminar provides an overview of the fundamentals of several types of chillers and how they function. It also reviews the controls of popular chiller interfaces and what to look for when monitoring them to help ensure they are running at their peak efficiency. Students have the opportunity to work with one of the three chillers in the training center which include Carrier, Trane, and York chillers.

ADVANCED CONTROLS & BUILDING AUTOMATION SYSTEMS

ADVANCED CONTROLS &
BUILDING AUTOMATION SYSTEMS

Stationary (NTF) Training Course Schedule

Prerequisite: Students should have taken Basic Controls and Building Automation Systems or have similar work experience

This advanced course has been developed for individuals who want to develop the understanding of how DDC controls and Building Automation Systems are installed, wired, operated, and programmed, also included is the insight of the various related software packages, that drive and manipulate these systems. We will discuss and demonstrate advanced control technologies dealing with the architecture of various manufactures of Building Automation Systems. We will demonstrate how they are installed, wired, and then programmed. Also, there will be main topic lectures on BAS Supervisory Controllers, Standalone controllers, and their communication protocols.
There will also be lectures on advanced control strategies and the understanding of building optimization for curtailing the use of energy.
After the completion of this course the participants will be able to:

- Describe the different types of control actions and when to use them
- Identify Building Automation System main components and where their used
- Define and select the proper Automation System for various locations
- Define the different types of Analog and Binary inputs and outputs
- Understand system wiring through various schematic diagrams of installed systems
- Wire Building Automation System main components
- Understand the various types of BAS communication protocols
- Program various type of industry controllers
- Comprehend the different types of operator interfaces and how they communicate
- Describe control strategies and how buildings are optimized for peak efficiency
- Define the different types of programming graphic methods

STATIONARY TRAINING CONFERENCE

Stationary Training Conference. This is for Local Union training staff and those invited by the local union to attend. Note, this is a 2 day event.

HIGH PRESSURE BOILER OPERATIONS

High Pressure Boilers course will help to assist in preparing the Stationary Engineer for the proper operation of High-Pressure boilers and will also help with preparing for the facility operating engineer licensing. This course provides a comprehensive overview of the safe and efficient operation of high-pressure steam boilers and related equipment. The latest combustion control technology, as well as EPA regulations and their implications, are covered in this course. The course is divided into sections to aid comprehension of key concepts:

- Steam Boilers
- Boiler Systems
- Steam Boiler Fittings
- Steam Systems
- Feedwater Systems
- Water Treatment
- Combustion Equipment
- Fuels and Combustion
- Combustion and Boiler Controls
- Draft Systems
- Instrumentation and Control Systems
- Steam Boiler Operation
- Licensing

WELDING

Courses will teach the student how to weld in all positions using different welding processes.

ROOFTOP UNIT MAINTENANCE & HVAC TROUBLESHOOTING

Light commercial Rooftop units are the topic of this class.. There will be extensive hands-on training for maintenance and service engineers who have had basic air conditioning training. **Students must have the EPA Universal Certification to participate in the practical activities of the course**. The focus will be on identifying various components of RTU's , charging practices , troubleshooting , repair, and maintenance.

SOLAR PANEL INSTALLATION MAINTENANCE &

TROUBLESHOOTING

This course work will include information on site location, system sizing, mounting options, system components, configurations, mechanical, electrical integration and code requirements. Topics also include Solar Radiation, System Components, Cells, Modules, and Arrays, Batteries, Inverters, System Sizing, Mechanical Integration, Electrical Integration, Utility Interconnection, Permitting and Inspection, Commissioning, Maintenance, and Troubleshooting. Students will receive hands on training in installation and configuration of actual solar voltaic systems.

CHIEF ENGINEER COURSE

This Seminar is designed for chief engineers or engineers training to make the transition to chief or lead engineer. This seminar will provide the student the necessary administrative and personnel skills to handle the day-to-day leadership challenges associated with this position.

The ten sections are:

- Recommended Skills levels
- Planning and Time Management
- Budget Preparation
- Computer Applications
- Record Keeping
- Benefits of an Internal Work Force
- Reports and Presentations
- Health and Safety
- Human Relations
- Energy Conservation.

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The Chief Engineers class has been updated as a Blended Learning Environment, in which traditional face-to-face instruction is also supplemented with specific computer assisted Learning. The purpose is to take advantage of the best features of both face-to-face and computer assisted learning in the same classroom setting. During class you will be given a set of credentials and guided how to log onto the platform. Once logged in, you will be instructed on how to use and navigate the system. Additionally, while performing some of the class exercises, you will be using various types of software for letter writing, email, budgets, presentations etc. With all that said, it would be advantageous if each member would bring their own laptop computer to class, being that some of these exercises will remain on the computer for the student's future reference. If you cannot bring your own laptop computer or you do not own a laptop computer, we can provide a computer for you to use during the class.