



International Union of Operating Engineers

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

Stationary (NTF) Training Course Schedule

Courses from May 3, 2024 - July 2, 2024

Course - Session	Date(s)
Pump Maintenance & Operation	May 6, 2024 - May 9, 2024
Welding	May 6, 2024 - May 10, 2024
Generator Maintenance & Operation	May 7, 2024 - May 10, 2024
Pump Maintenance & Operation	May 10, 2024 - May 13, 2024
Boiler System Efficiency	May 13, 2024 - May 15, 2024
OSHA 510 Safety & Health Standards for the Construction Industry	May 14, 2024 - May 17, 2024
OSHA 500 Trainer Course Construction Industry	May 18, 2024 - May 21, 2024
Indoor Air Quality	May 18, 2024 - May 20, 2024
HVAC Systems 1	May 20, 2024 - May 24, 2024
Member Assistance Program - It's time to Get Uncomfortable: Bringing Awareness to Lifestyle Issues and Focusing on the Path to Prevention, Recovery and Support	May 21, 2024 - May 23, 2024
Welding	Jun 3, 2024 - Jun 7, 2024
Teaching Techniques I	Jun 3, 2024 - Jun 7, 2024
Mechanics Training - Hydraulic Fundamentals	Jun 3, 2024 - Jun 7, 2024
OSHA 511 Occupational Safety and Health Standards for General Industry	Jun 4, 2024 - Jun 7, 2024
Blueprint Reading for Stationary Engineers	Jun 4, 2024 - Jun 8, 2024
Solar Panel Installation Maintenance & Troubleshooting	Jun 6, 2024 - Jun 9, 2024
OSHA 501 Safety & Health Standards for General Industry	Jun 8, 2024 - Jun 11, 2024

Visit <https://iuoe-itrs.org> for a Full Schedule and to Register for Classes

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Basic Controls and Building Automation Systems	Jun 8, 2024 - Jun 10, 2024
Chief Engineer/Facility Management Seminar	Jun 10, 2024 - Jun 14, 2024
Pump Maintenance & Operation	Jun 10, 2024 - Jun 13, 2024
Advanced Controls & Building Automation Systems	Jun 11, 2024 - Jun 13, 2024
Air & Hydronic Testing and Balancing	Jun 15, 2024 - Jun 18, 2024
HVAC Systems 1	Jun 15, 2024 - Jun 19, 2024
Chiller Efficiency	Jun 19, 2024 - Jun 21, 2024
Electrical Troubleshooting & Variable Frequency Drive Operations	Jun 20, 2024 - Jun 23, 2024
Electrical Systems 2	Jun 24, 2024 - Jun 28, 2024
Welding	Jun 24, 2024 - Jun 28, 2024
Certified Pool Operator	Jun 25, 2024 - Jun 27, 2024
Instrumentation and Controls	Jun 25, 2024 - Jun 29, 2024

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Training Course Descriptions

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.

WELDING

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

GENERATOR MAINTENANCE & OPERATION

This class is intended for Apprentice through Mid-level journeyman. It covers for both "theory and practical" knowledge on diesel generator operation.

The seminar will have three primary categories:

- 1) Diesel generator maintenance and operation
- 2) Safety with emphasis on OSHA standards, Title 29 1910 & 1926 Code of Federal Regulations
- 3) Basic electrical knowledge as per National Electrical Code guidelines Students will have hands on time with a diesel generator package.

BOILER SYSTEM EFFICIENCY

This course is designed to assist in the education and development of the individual who has the responsibilities for the day to day operation and maintenance of their boiler and the ancillary equipment. This individual will gain the knowledge and understanding of how to properly operate the equipment safely and more efficiently. This course will also provide the proper sequence of



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operation or timing that will assist in the troubleshooting area and reduce downtime and increase reliability. The program includes plant tours to reinforce lessons learned.

OSHA 510 SAFETY & HEALTH STANDARDS FOR THE CONSTRUCTION INDUSTRY

OPEN TO IUOE INSTRUCTORS ONLY

This course covers OSHA policies, procedures, and standards, as well as construction safety and health principles. Topics include scope and application of the OSHA construction standards. Special emphasis is placed on those areas that are the most hazardous, using OSHA standards as a guide. Completion of this class is required prior to taking the OSHA 500 class.

OSHA 500 TRAINER COURSE CONSTRUCTION INDUSTRY

OPEN TO IUOE INSTRUCTORS ONLY

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

INDOOR AIR QUALITY

This course covers the vast issues of IAQ in commercial buildings and how to handle the everyday problems, how to prevent and solve IAQ problems effectively, how to work with building management and owners in developing an IAQ maintenance and tracking program, and explains the latest IAQ concerns such as airborne contaminants, mold, and radon mitigation.

HVAC SYSTEMS 1

Heating Ventilation Air Conditioning and Refrigeration are core topics for Stationary Engineers. This course is designed to give students an solid understanding of HVACR. After taking this class students will have:

- Knowledge of fundamental refrigeration principles.



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- Knowledge of fundamental HVAC principles.
- Knowledge of HVAC system components.
- Knowledge of HVAC control systems.
- Understand air comfort and quality.
- Ability to solder and braze connections for piping systems.

This course includes hands on training with state of the art tools and equipment.

MEMBER ASSISTANCE PROGRAM - IT'S TIME TO GET UNCOMFORTABLE: BRINGING AWARENESS TO LIFESTYLE ISSUES AND FOCUSING ON THE PATH TO PREVENTION, RECOVERY AND SUPPORT

Peer training on developing local Member Assistance Programs.

TEACHING TECHNIQUES I

Teaching Techniques I is designed especially for part-time, new or recently hired instructors. The course presents useful introductory concepts and also requires actual practice teaching with constructive feedback. It is conducted over a 4-½ day period. It will provide instructors with all materials and demonstrate various teaching techniques for classroom application and meets the U.S. Department of Labor requirements for apprentice instructor training.

MECHANICS TRAINING - HYDRAULIC FUNDAMENTALS

Mechanics Training - Hydraulic Fundamentals

This course will give the student a strong foundation in hydraulic systems used in mobile equipment. Upon completion, participants will be able to:

- Describe the principles of hydraulics.



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- Identify and describe the function of the components that make up a typical hydraulic system.
- Identify and read the schematic symbols in a typical hydraulic schematic.
- Understand the use and operation of load sensing variable displacement pumps.

The learning environment will be established in both the classroom and the service shop.

OSHA 511 OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR GENERAL INDUSTRY

OPEN TO IUOE INSTRUCTORS ONLY

This course covers OSHA Standards, policies, and procedures in general industry. Topics include scope and application of the OSHA General Industry Standards, general industry principles and special emphasis on those areas in general industry which are most hazardous.

Completion of this class is required prior to taking the OSHA 501 class.

BLUEPRINT READING FOR STATIONARY ENGINEERS

Students will be exposed to various subjects related to blueprint reading, such as blueprints, construction materials, construction methods, specifications, branding, and quantity takeoff. Students will spend approximately 70% of classroom time with hands-on labs utilizing a variety of the prints and specifications that are most often used as reference and guidance for the Stationary Engineer. Specific emphasis on owner branding, electrical, HVAC, and plumbing prints, and their use in the industry.

SOLAR PANEL INSTALLATION MAINTENANCE & TROUBLESHOOTING



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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.

OSHA 501 SAFETY & HEALTH STANDARDS FOR GENERAL INDUSTRY

OPEN TO IUOE INSTRUCTORS ONLY

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

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

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- 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 through 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



CHIEF ENGINEER/FACILITY MANAGEMENT SEMINAR

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

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- Record Keeping
- Benefits of an Internal Work Force
- Reports and Presentations
- Health and Safety
- Human Relations
- Energy Conservation.

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.

ADVANCED CONTROLS & BUILDING AUTOMATION SYSTEMS

ADVANCED CONTROLS & BUILDING AUTOMATION SYSTEMS

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.



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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

AIR & HYDRONIC TESTING AND BALANCING

This seminar is designed to enhance an engineer's air and hydronic balancing skills. Students will become familiar with the proper tools, instruments, and common methods of transferring air and water through a facility. Students will work on actual equipment including Air Handler, VAV's and fan boxes, dampers, various types of diffusers, blueprints, and appropriate tools and measuring devices.

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.

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



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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.



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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.

CERTIFIED POOL OPERATOR

This course will prepare the student for the Pool & Hot Tub Alliance (PHTA) (formerly National Swimming Pool Foundation (NSPF) certified pool operator exam. The test will be administered by an authorized PHTA instructor on the last day of the course. The certification is valid for five years from date of course completion. There is a cost to the student of \$45.00 for the certification.

INSTRUMENTATION AND CONTROLS

Instrumentation and Controls is an introductory course covering basic skills and concepts used in the field. The curriculum will provide students with a solid foundation for various industrial applications and process operations in various stationary facilities. The course will cover instrumentation principles including pressure, flow, level and temperature, as well as safety and tools of the trade. Students will become familiar with control valves and controllers, and learn various control schemes which include transmitter calibration and system troubleshooting.