

Electrical Worker Training

Electrical Engineering Services & Systems

Electrical Worker Training

Catalog



ELECTRICAL &
POWER THEORY



ELECTRICAL SAFETY
& COMPLIANCE



ELECTRICAL
MAINTENANCE & TESTING



POWER
DISTRIBUTION EQUIPMENT



INSTALLED SYSTEMS



Powering Business Worldwide

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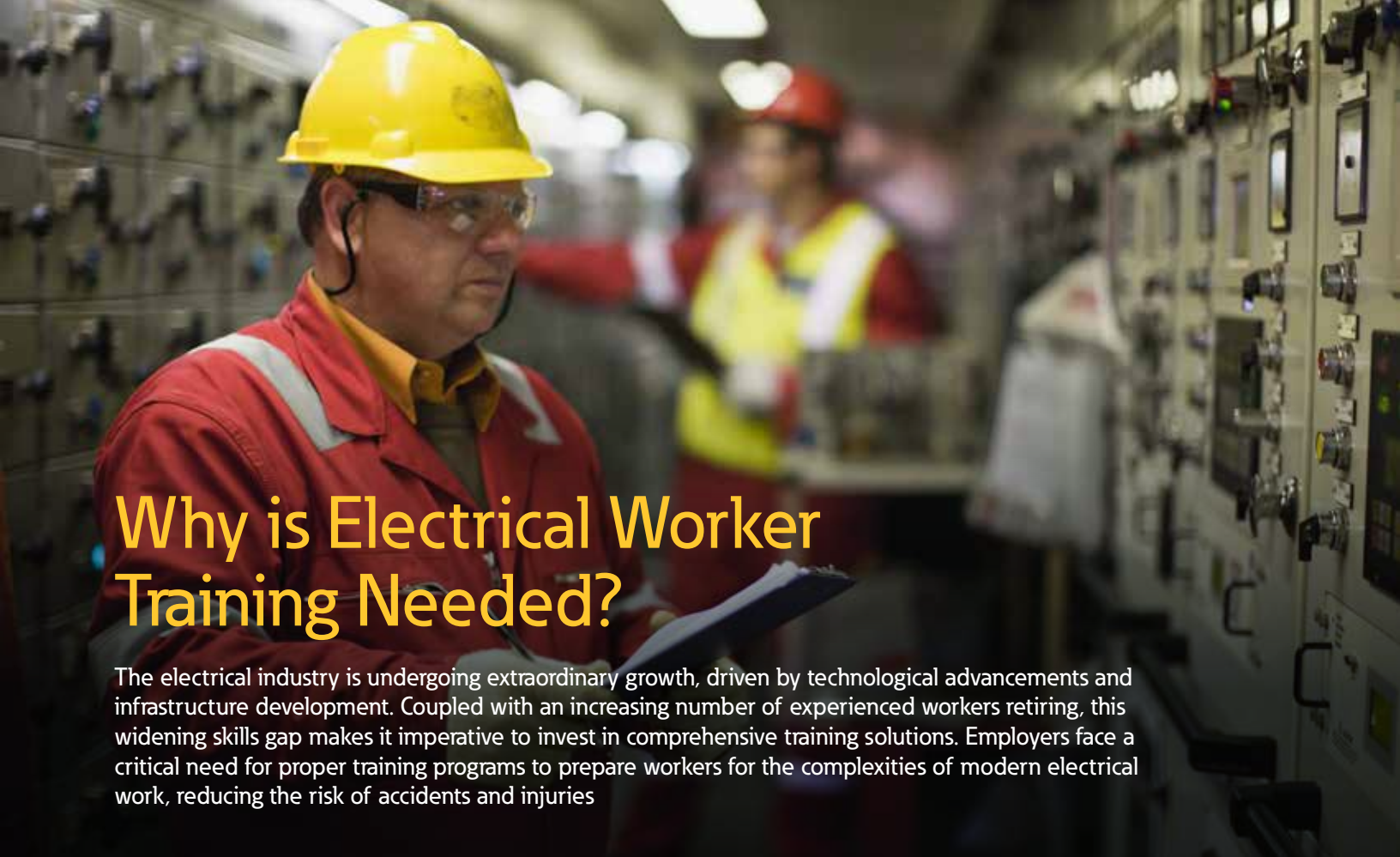
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Why is Electrical Worker Training Needed?

The electrical industry is undergoing extraordinary growth, driven by technological advancements and infrastructure development. Coupled with an increasing number of experienced workers retiring, this widening skills gap makes it imperative to invest in comprehensive training solutions. Employers face a critical need for proper training programs to prepare workers for the complexities of modern electrical work, reducing the risk of accidents and injuries



Safer Future, Together

Electrical work is inherently dangerous and ensuring the safety of both workers and the public is paramount. Proper training is essential to uphold safety standards, resulting in less accidents and higher quality work.



Growing Workforce Demand

In recent years, the electrical industry has been grappling with a critical challenge that threatens to stall progress: the widening skill gap. For every five skilled electricians retiring, only two new workers are stepping into the trade. This 5:2 ratio is a statistic that is calling for need of training more electrical workers in the industry.



Stringent Regulations

In the U. S. , all electrical work practices must comply with stringent regulations, including NFPA 70E, OSHA and state-adopted electrical safety requirements. Given these rigorous standards, comprehensive training for electrical workers is essential.

Why Eaton?

Electrical Worker Training provides comprehensive training solutions to equip you with the knowledge for safe and efficient operations. Our training programs draw on 100+ years of experience manufacturing electrical power systems equipment and more than 2 decades of experience working with customers to install, start up, commission, maintain and modernize Eaton and third-party equipment.

Experienced Instructors

Our instructors are recognized experts in their fields, with many having served or are currently serving on industry boards to develop safety and product standards. Additionally, most of our instructors bring extensive field experience performing startup and maintenance on power distribution equipment and conducting power systems analysis. At our training classes, you can be certain of receiving top-notch education from industry leaders.

World Class Training Centers

Eaton's Experience Centers, located in Pittsburgh, PA and Houston, TX, offer attendees the unique opportunity to interact with power distribution equipment in a safe, real-world environment. Our approach focuses on 'pulling back the curtain' to provide a comprehensive view of systems from a broad perspective. Attendees can dive into the operation of products and gain a deep understanding of their design, technology and installation practices.

Trusted Training Partner

Eaton is proud to have one of the largest and most experienced teams of Power Systems Engineers and Field Service Professionals in the industry. By enrolling in our classes, you will receive exceptional training experiences based on our best-in-class internal programs, ensuring you gain the skills and knowledge needed to excel. Additionally, Eaton's courses offer professional Continuing Education Units (CEUs) for professionals certified through the Community College of Allegheny County, Pittsburgh, PA.

Our Site, Your Site, Any Site

At Eaton, we understand the importance of flexibility in today's fast-paced world. Our training programs are designed to accommodate your busy schedule, allowing you to take classes from anywhere. Attend an in-person training at our site, have us come out to your site, or log in online from any site - our comprehensive and high-quality training offerings ensure that you can continue to develop your skills without compromising on convenience.



Training Hub for Workforce Success

Take control of your success in the workforce with flexible training options designed to help grow your skills and prepare for meaningful career achievements. Whether you're looking for quick, on demand courses or fully customized solutions with personalized, hands-on experiences - we've got you covered! Are you part of a large enterprise, with a distributed workforce? No problem! From individual learners to large enterprises, our scalable programs make it easy to learn what you need, when you need it—all in one place.



| TRAINING | VALUE |
|---|--|
| <p>On Demand Access a library of on demand, self-paced courses designed to build foundational skills quickly and efficiently. These programs are ideal for learners who want flexibility and autonomy, with content created by our experts to meet common workforce needs. Perfect for individuals or teams looking to get started right away without customization.</p> | Learn at your own pace with proven, ready-to-go training. |
| <p>Standard Classes Choose from our curated catalog of training courses covering essential skills and topics. These proven programs are led by a live instructor - promoting engagement and discussion. Classes can be taken as part of our open enrollment program, or as a closed session amongst a group - making them a flexible, efficient option for both personal development and team-wide learning.</p> | Accessible, flexible training - ready when you are, scalable when you need it. |
| <p>Custom Classes Partner with us to design fully personalized training experiences from the ground up. Through consultation, we build programs that reflect your workflows, systems and challenges - ideal for complex environments or strategic initiatives. Every element is crafted to align with your business priorities and learning culture.</p> | Built-from-scratch curriculum, designed just for you. |

Training Domains

| ELECTRICAL & POWER THEORY | ELECTRICAL SAFETY & COMPLIANCE | ELECTRICAL MAINTENANCE & TESTING | POWER DISTRIBUTION EQUIPMENT | INSTALLED SYSTEMS |
|--|--|--|--|--|
| Fundamental classes to develop an understanding of electrical systems. | Occupational training to perform electrical work safely. | Instruction on general electrical equipment maintenance procedures and industry testing methods. | Detailed programs on operation and service of specific power distribution equipment. | Overview and functional training on installed systems at your site |

Contact Us





Delivery Methods



In-person Instruction

In-Person Instruction combines theory-based learning with hands-on practice using real equipment. Our live classroom sessions provide instant feedback from expert trainers, allowing you to learn and demonstrate your abilities in a safe and controlled environment.



Remote Instruction

Remote Instruction offers live, instructor-led sessions that enable engaging participation across a distributed workforce. These virtual sessions are cost-effective compared to traveling to a centralized training location, providing a convenient alternative to In-Person Instruction.



eLearning

eLearning brings unparalleled flexibility with a vast library of on-demand content, providing access to learning modules anytime, anywhere. Our extensive digital library covers a wide variety of training topics, allowing you to take classes at your own pace and availability.



Open Enrollment

Open Enrollment classes are scheduled sessions throughout the year which are open for any individual to register. Class sizes are limited so be sure to sign up!



Training that Moves with You Powered by Eaton's Mobile Training Trailers

Who should use the Mobile Training Trailers?

Managers and engineers looking for hands-on safety, maintenance and operation training of power distribution equipment.

Learning objective

Learn from experienced experts in a collaborative and interactive environment. The Mobile Training Trailers contains the equipment of an entire power distribution system in a trailer capable of being delivered to your location. This allows for a cost effective method of training by eliminating travel of your employees.

What to expect?

The Eaton Mobile Training Trailers requires a relative flat area 80ft x 16ft. Upon arrival of the trailer, an Eaton representative will set it up and prepare it for your training session. At the end of the training, your Eaton trainer will close the trailer and prepare it for transport.

Eaton trainers are subject matter experts in safe operation and maintenance of power distribution system. Eaton's Mobile Training Trailers allows hands-on activities in addition to traditional classroom-style training.

Equipment on the Mobile Training Trailers include:

Trailer One:

- Medium voltage fused switch
- Low voltage Magnum DS switchgear
- Switchboards
- Panelboards
- Bolted pressure switch
- Automatic transfer switch

Trailer Two:

- Medium voltage fused switches
- VCPW switchgear
- Low voltage Magnum DS switchgear with NRX breakers
- Panelboards
- Dry type transformer
- AmpGard starter

Trailer Three:

- Low voltage Magnum DS switchgear
- Panelboards
- Contactor type Automatic Transfer Switch
- Breaker type Automatic Transfer Switch
- Bypass Automatic Transfer Switch
- Magnum DS Automatic Transfer Switch

Learning Paths

Get started on a Learning Path today!

Eaton is your dedicated educational partner throughout your career. Our Learning Paths are tailored to allow students to focus on the skills and knowledge most relevant to their roles, ensuring an efficient and effective learning experience. Let us guide you with curated sequences of courses aligned with your requirements. Progress at your own pace as you continue gaining experience and your career evolves. Learning Paths ensure that students can continuously develop the skills needed to stay competitive and adapt to new challenges!

I am an Electrical & Maintenance Technician

- Work on or near electrical equipment
- Responsible for energizing electrical equipment
- Test electrical equipment
- Service, upkeep, or maintain electrical equipment

Basic Electrical Testing

Elective: Power Distribution Equipment

Understanding & Overview of Low Voltage and Medium Voltage Electrical Drawings

Electrical Safety for the Qualified Worker

Elective: Installed Systems

Hazardous Energy Control

Elective: Electrical Maintenance & Testing

I am an Engineer

- Design electrical systems to be installed at facilities or substations
- Oversee installation of electrical systems

Basic Electrical Testing

Unqualified Person Basic Job Site Awareness

Understanding & Overview of Low Voltage and Medium Voltage Electrical Drawings

Electrical & Arc Flash Safety

Elective: Electrical & Power Theory

Elective: Power Distribution Equipment

Elective: Electrical Maintenance & Testing



ELECTRICAL & POWER THEORY



ELECTRICAL SAFETY & COMPLIANCE



ELECTRICAL MAINTENANCE & TESTING



POWER DISTRIBUTION EQUIPMENT



INSTALLED SYSTEMS




I am a
Facilities Operator

- Work on or near electrical equipment
- Operate electrical equipment on site

| | | | |
|---|--|---|--|
|  Basic Electrical Testing |  Unqualified Person Basic Job Site Awareness |  <i>Elective: Installed Systems</i> |  Electrical & Arc Flash Safety |
|---|--|---|--|

I am an
EHS Professional

- Responsible for environmental health and safety at a facility
- Develop safety policies and procedures

| | | | |
|--|---|---|---|
|  Unqualified Person Basic Job Site Awareness |  Unqualified Person Personal Protective Equipment |  Electrical Safety for the Qualified Worker |  Hazardous Energy Control |
|--|---|---|---|

I am an
Engineering & Maintenance Manager

- Manage a team that works on or near electrical equipment
- Responsible for workforce development
- Accountable for keeping equipment and operations flowing

| | | | | |
|--|---|--|---|--|
|  Unqualified Person Basic Job Site Awareness |  Unqualified Person Personal Protective Equipment |  <i>Elective: Power Distribution Equipment</i> |  <i>Elective: Installed Systems</i> |  Electrical & Arc Flash Safety |
|--|---|--|---|--|

| | | | | |
|---|--|--|--|---|
|  ELECTRICAL & POWER THEORY |  ELECTRICAL SAFETY & COMPLIANCE |  ELECTRICAL MAINTENANCE & TESTING |  POWER DISTRIBUTION EQUIPMENT |  INSTALLED SYSTEMS |
|---|--|--|--|---|



Electrical & Power Theory

Were you given a one-line drawing and you aren't sure what do to with it? The Electrical & Power Theory training domain provides students with a solid foundation in the principles of electricity and power systems, which is essential for understanding more advanced topics. These trainings are designed to enhance participants' ability to analyze and troubleshoot electrical systems, leading to improved problem-solving skills. By combining theoretical knowledge with practical exercises, participants gain the skills needed to effectively analyze, troubleshoot and design electrical systems in real-world scenarios.

These trainings are ideal for professionals working in the electrical and adjacent industries - including Engineers, Electrical and Maintenance Technicians and Facilities Operators. They are suitable for individuals seeking to enhance their knowledge and skills, whether they are new to the field or looking to advance their careers. Additionally, these trainings will benefit organizations aiming to improve the competency and safety of their workforce in managing and maintaining electrical systems.

Course List

- CYMCAP Basic Training
- CYME Basic Training
- Industrial Power Systems Analysis I
- Industrial Power Systems Analysis II
- Overcurrent Protection
- Overvoltage Protection
- Power Quality Monitoring and Analysis
- Understanding and Overview of Low Voltage and Medium Voltage Electrical Drawings
- Microgrids and Distributed Energy Resources

Go to Training Domain



Featured Courses

Overcurrent Protection

Abstract

This workshop provides a combination of hands-on training and in-depth technical knowledge on Overcurrent Protection, delivered by an industry expert. Eaton offers the unique combination of real-world, everyday problem-solving skills and instructors with extensive hands-on field experience. The reference materials binder, specially prepared for this course, is a thorough resource written by Eaton Power Systems engineers and includes practical information to help you accomplish your day-to-day objectives.

Course topics include

Fuse-to-fuse expulsion and current-limiting coordination

- Transformer fusing protection
- Protection with sectionalizers
- Recloser and source-side coordination
- Recloser and load-side coordination
- Electronically and hydraulically controlled recloser coordination
- Exposure to CYME™ power engineering software
- Overcurrent relay coordination with fuses and recloser



24 Hrs
2.4 CEU



16 Hrs
1.6 CEU



Understanding and Overview of Low Voltage and Medium Voltage Electrical Drawings

Abstract

Using drawings from various distribution systems and equipment, attendees will learn standard symbols and drawing styles used to represent electrical distribution systems and equipment. Attendees will be able to reference the physical equipment to drawings that will assist in LOTO planning and implementation, startup and commissioning activities and troubleshooting.

Course topics include

Standards

- IEEE
- Symbols
- Distribution equipment
- Protective devices
- Device number

Equipment specific

- Layout
- Three line
- Wiring
- Control schematics

Types

- System Drawings
- Single line
- Riser
- Impedance



24 Hrs
2.4 CEU



8 Hrs
0.7 CEU



5.5 Hrs



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment

Courses

CYMCAP Basic Training

This training course covers the fundamental use of CYMCAP software for calculating ampacity and temperature rise in power cable installations. It helps users effectively utilize the software by teaching them how to collect and assemble cable and installation data to build a model. Finally, the course explores CYMCAP's full range of functionalities and output capabilities, enabling users to analyze and interpret simulation results.



10 Hrs

CYME Basic Training

This training course covers the fundamental use of CYME software for distribution analysis, helping users effectively utilize the software by teaching them how to collect and assemble network data to build a distribution system model. Finally, the course explores CYME's full range of functionalities and output capabilities, enabling users to analyze and interpret simulation results.



15 Hrs

Industrial Power Systems Analysis I

This training program reviews the fundamental techniques of power systems analysis using classroom exercises and demonstrations. Although it is not intended to teach the use of power systems analysis software, the class will use laptop computers and review examples to help explain the construction of system single-line diagrams and the calculation of short-circuit current.



36 Hrs
3.6 CEU

36 Hrs

Industrial Power Systems Analysis II

This course will verify and validate the technical knowledge of engineers who perform power system analyses regularly. Upon successful completion, attendees will be able to identify the settings of protective devices to properly protect a power distribution system according to the National Electric Code (NFPA 70). They will also demonstrate coordination analysis skills in a small power distribution system by reading manufacturers' time current curves and drawing system time current curves and apply IEEE and NFPA standards at various locations within a power distribution system to calculate the incident energy during a worst-case arc flash event.



24 Hrs
2.4 CEU

24 Hrs

Overcurrent Protection

This workshop uniquely combines experienced engineers, hands-on learning, and technical information, along with a comprehensive reference manual. Eaton offers real-world problem-solving skills and instructors with extensive hands-on field experience. The specially prepared reference materials binder, written by Eaton Power Systems engineers, includes practical information to help you achieve your day-to-day objectives.



24 Hrs
2.4 CEU

16 Hrs
1.6 CEU

Overvoltage Protection

In this course, you'll learn how to economically prevent excessive transient over voltages from damaging electric utility distribution systems equipment or interrupting normal power system operation. You'll explore standard and extraordinary conditions where standard overvoltage protection applications may not be effective and learn how to make overvoltage protection schemes as effective as possible within given economic constraints. The course illustrates various surge arrester applications and demonstrate concepts and transient phenomena by utilizing the actual utility equipment.



16 Hrs
1.6 CEU

12 Hrs
1.2 CEU

Power Quality Monitoring and Analysis

This course teaches engineers and technicians how to diagnose power quality problems and perform measurements of sags, swells, voltage transients, harmonic distortion and voltage flicker. Find and pinpoint power quality issues, measure them and use proven methods for correcting them. More than half of the training program is dedicated to hands-on practice using various popular models of portable and panel-mount power monitors.



20 Hrs
2 CEU

8 Hrs
0.7 CEU



Courses

Understanding and Overview of Low Voltage & Medium Voltage Electrical Drawings.

The goal of this 3-day workshop is to familiarize students with reading and understanding various drawing types and styles for electrical distribution systems and equipment. Using drawings from different distribution systems and equipment, attendees will learn standard symbols and drawing styles used to represent electrical distribution systems and equipment. They will be able to reference physical equipment to drawings, aiding in LOTO planning and implementation, startup and commissioning activities and troubleshooting.



24 Hrs
2.4 CEU



8 Hrs
0.7 CEU



5.5 Hrs



Microgrids and Distributed Energy Resources

This 2-day course aims to provide attendees with a comprehensive understanding of microgrids and DER (distributed energy resources) applications, revenue streams and control. The reliability of the U. S. power grid has been significantly compromised by factors such as aging equipment, lack of maintenance, insufficient infrastructure and the proliferation of energy-hungry devices. Microgrids, with their ability to isolate from the primary grid, have emerged as an ideal solution to ensure energy resiliency, independence from utilities, islanding, load control and more.



16 Hrs
1.6 CEU



16 Hrs



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment



Electrical Safety & Compliance

Do you know what Arc Flash is and how it occurs? The Electrical Safety & Compliance training domain is designed to help students understand and comply with essential safety regulations and standards, thereby reducing the risk of accidents and injuries in the workplace. This comprehensive training program covers a wide range of topics, including the identification and mitigation of electrical hazards, proper use of personal protective equipment (PPE), safe work practices and NFPA70E standards. By enhancing participants' ability to recognize and address potential dangers, these trainings lead to a safer work environment and promotes a culture of safety within organizations.

These trainings are perfect for professionals working in the electrical and adjacent industries - including Engineers, Electrical & Maintenance Technicians, Facilities Operators and Environmental & Health Safety (EHS) specialists. Employees at all experience levels can benefit from safety trainings and it is important that they are refreshed on a recurring basis to ensure ongoing awareness and adherence to safety standards.

Course List

- Electrical and Arc Flash Safety
- Electrical Safety for the Qualified Worker
- Hazardous Energy Control
- Safety Regulations (NFPA, OSHA)
- Arc Flash
- Shock
- Safe Work Procedures
- Selecting and Using PPE
- Job Safety Analysis
- Temporary Grounding
- LOTO
- Unqualified Person Basic Job Site Awareness
- Unqualified Person Personal Protective Equipment

Go to Training Domain



Featured Courses

Electrical and Arc Flash Safety

Abstract

Personnel safety is the most important concern in the workplace. NFPA 70E sets standards for electrical safety in the work environment & keeps workers safe while working on or around electrically energized equipment. IEEE 1584 sets the industry standard for evaluating the arc flash hazards in a power distribution system and its equipment. OSHA 29CFR1910 subparts R and S tie these standards and governmental regulations for electrical safety together. OSHA mandates regarding electrical safety in the workplace specifically require employer assessment of generally recognized hazards in the workplace and provisions for protecting the employee from those hazards. OSHA 29CFR1910 subparts R & S tie these standards & governmental regulations for electrical safety.

Course topics include

General information

- Regulations, standards and codes
- OSHA [29 CFR 1910. 399 Part 2]
- NFPA 70E
- Your employer's electrical safety program

Electrical Safety for the Qualified Worker

Abstract

This course provides workers exposed to electrical hazards with the knowledge and skill sets for electrical safe work practices and lockout/tagout, shock and arc flash hazard assessments and job hazard analysis as required by OSHA and NFPA 70E. More important, it provides employees with the skills necessary to maintain a safe work environment and return home safely at the end of their day.

This course provides both traditional classroom instruction and hands-on demonstrations of safe work practices. Skill demonstrations and lab exercises include donning PPE, checking for the absence of voltage, creating and executing a LOTO procedure and grounding and establishing an electrically safe work condition. The class ends with practical testing and assessment.

Working safely on or around energized electrical equipment

Temporary grounding

- Protective grounding equipment
- Procedure for using temporary grounding conductors
- Ground-fault circuit-interrupter (GFCI) protection

Working in a situation where an arc-flash or shock hazard exists

- Electrically safe working condition and exceptions that might justify working around live parts
- Working in a situation where an arc flash hazard exists
- How do power systems engineers determine incident energy and arc flash boundaries
- Classroom exercise — assess the risk of an arc flash

Selecting and using personal protective equipment and insulated tools

- PPE for electrical work
- Selecting arc-rated garments and other PPE for arc flash protection
- Picture examples of arc-rated clothing and other PPE
- Selecting and using insulated tools



8 Hrs
0.8 CEU



8 Hrs
0.8 CEU



5.5 Hrs



24 Hrs
2.4 CEU



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment

Courses

Electrical and Arc Flash Safety

At completion of this course, students will be able to avoid working on or near energized equipment. Where exposure cannot be avoided, students will learn to implement safety procedures to minimize dangers adhering to the guidelines of NFPA 70E.



8 Hrs
0.8 CEU



8 Hrs
0.8 CEU



5.5 Hrs



Electrical Safety for the Qualified Worker

This course provides workers exposed to electrical hazards with the knowledge and skill sets for electrically safe work practices, lockout/tagout, shock and arc flash hazard assessments and job hazard analysis as required by OSHA and NFPA 70E. More importantly, it provides employees with the skills necessary to maintain a safe work environment and return home safely at the end of their day. This class contains both traditional classroom instruction and hands-on demonstrations of safe work practices.



24 Hrs
2.4 CEU



Hazardous Energy Control

The objective of this safety program is to enable the worker to better understand and define the work location to isolate and mitigate the hazards that exist in their work location. This course teaches students how to recognize and mitigate hazards in the work environment along with methods of controlling additional hazards previously overlooked. The class will contain demonstrations and limitations of metering devices and the how/why they should be used.



28 Hrs
2.8 CEU



Safety Regulations (NFPA, OSHA)

This class dives into the safety regulations and standards established by NFPA and OSHA, illustrating how they work together to foster a safer workplace for employees. Attendees will receive an overview of general safety requirements with respect to electrical safety.



1 Hr



1 Hr



Arc Flash

This class focuses on the fundamentals of arc flash, what is an arc flash and how to calculate the amount of incident energy released during an arc flash event. It provides detailed information on how to protect against arc flash hazards utilizing PPE and other engineering solutions.

This course is offered in both Basic (1 Hr) and Advanced (4 Hrs) levels to suit different learning needs.



1 Hr
or
4 Hrs



1 Hr
or
4 Hrs



Shock

This class focuses on the fundamentals of shock hazards, what is a shock versus electrocution and how current and time affects the severity of injuries. It provides detailed information on how to protect against shock hazards utilizing PPE and other engineering solutions.



1 Hr



1 Hr



Safe Work Procedures

This class teaches the procedures for safe work practices around electrical systems, including lockout/tagout (LOTO) and job safety analysis. It ensures that workers follow safe procedures during maintenance. The class will also provide hands-on training on LOTO devices and techniques. Attendees will learn how to conduct thorough job safety analyses to identify and mitigate risks.



1 Hr



1 Hr



Selecting and Using PPE

This class provides guidance on selecting and using personal protective equipment (PPE) for electrical work, including types of PPE and proper usage. Additionally, it will cover the inspection of PPE to ensure its effectiveness.



1 Hr



1 Hr



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment

Courses

Job Safety Analysis

This class covers the process of job safety analysis, including hazard identification and risk assessment. It provides a systematic approach to identifying and mitigating workplace hazards before work is performed.



Temporary Grounding

This class teaches the principles and practices of temporary grounding in electrical systems, including equipment and procedures. It ensures that temporary grounding is done safely and effectively. Additionally, it will cover the selection and installation of grounding equipment.



LOTO

This class covers the lockout/tagout (LOTO) procedures for ensuring safety during maintenance and servicing of electrical systems. It emphasizes the importance of LOTO in preventing accidental energization.



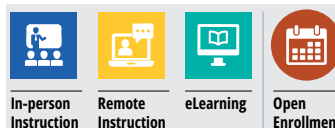
Unqualified Person Basic Job Site Awareness

This course is designed for unqualified persons tasked with working around (not on) electrical equipment. Per NFPA 70E, unqualified persons shall be trained in, and be familiar with, any electrical safety-related practices necessary for their safety. Thus, in these terms, an unqualified person does not directly engage in electrical work, but may be engaged in other non-electrical work. This series of learning activities provides guidance on how to work around electrical equipment as well as other equipment and/or hazards that may be in the vicinity.



Unqualified Person Personal Protective Equipment

This course is designed for unqualified persons tasked with working around (not on) electrical equipment. Per NFPA 70E, unqualified persons shall be trained in and be familiar with, any electrical safety-related practices necessary for their safety. Thus, in these terms, an unqualified person does not directly engage in electrical work but may be engaged in other non-electrical work. This series of learning activities provides guidance on how to work around electrical equipment as well as other equipment and/or hazards that may be in the vicinity.





Electrical Maintenance & Testing

Are you expected to maintain all your electrical equipment, so it won't fail? The Electrical Maintenance & Testing training domain equips participants with the general skills and knowledge needed to maintain and test electrical systems and equipment effectively. This domain includes topics such as basic electrical testing, industry standards, preventive maintenance, troubleshooting and diagnostic testing. These classes enhance participants' ability to identify and address potential issues before they become major problems, leading to improved system reliability and reduced downtime. By learning best practices and industry standards, participants will be able to properly maintain electrical equipment, leading to reduced downtime and improved system reliability.

This training domain is ideal for professionals in the electrical and adjacent industries, especially Engineers and Electrical & Maintenance Technicians. It is highly beneficial for individuals aiming to expand their expertise in electrical maintenance and testing. Whether participants are newcomers to the field or seasoned professionals seeking career advancement, they will acquire essential skills and knowledge in general electrical maintenance procedures and testing methods.

Course List

- Basic Electrical Testing
- Basic Protective Relay Testing
- Switchgear Maintenance
- Transformer Startup and Maintenance
- NFPA 70B
- Battery Safety and Maintenance
- Introduction to IR, Ultrasound, Partial Discharge and De-Energized Switchgear Testing

Go to Training Domain



Featured Courses

Basic Electrical Testing

Abstract

Preventative maintenance, startup and commissioning activities require basic electrical tests to be performed to ensure the equipment is in an operable state throughout its life. A combination of various major manufacturers' test sets are used to perform practical classwork. Testing will be performed on actual equipment providing the student an easier transition from the classroom to the job.

Basic electrical testing course includes

- Behavior of insulation systems
- Insulation resistance tests
- Dielectric tests
- AC withstand tests
- Vacuum bottle integrity tests
- Low resistance tests
- Secondary injection tests



32 Hrs
3.2 CEU

Switchgear Maintenance

Abstract

Using classroom and training laboratory exercises, attendees learn how to classify switchgear and switchgear components. Nameplate ratings for circuit breakers and switchgear assemblies are discussed and identified on actual equipment. Maintenance of switchgear assemblies and assemblies components is discussed along with how to properly maintain power circuit breakers and molded case breakers.

Course topics include

- Inspection of Magnum DS circuit breaker and test of Digitrip 1150+
- Magnum DS LV power circuit breaker — measurements of insulation resistance and primary circuit resistance
- Verifying the performance of a zone interlocking scheme in a Magnum DS assembly
- Functional testing of arc flash reduction maintenance mode — Digitrip 520MC
- Magnum DS switchgear, circuit breaker racking
- Interlocks and controls — VacClad-W switchgear
- Door interlocks of an arc-resistant VCP-W assembly, MR2 motorized remote racking device, closure measurement
- Testing and inspecting medium-voltage control-power and instrument transformers
- Commissioning inspections and tests for a TRITON SL Ampgard
- Inspection of Ampgard medium voltage, FVNR, type SJA
- Inspection of an MVS switch



32 Hrs
3.2 CEU



In-person Instruction Remote Instruction eLearning Open Enrollment

Courses

Basic Electrical Testing

At the completion of this course, students will learn fundamentals of basic electrical testing required for startup, commissioning and preventive maintenance. A combination of various major manufacturers' test sets are used to perform practical classwork. Testing will be performed on actual equipment providing the student an easier transition from the classroom to the job.



32 Hrs
3.2 CEU



Basic Protective Relay Testing

At the completion of this course, students will be able to test the most common IEEE protective relay functions on a variety of products. Demonstrations with relays from various manufacturers will be used for the best experience and education. The class will also review drawings of AC and DC relay schemes with a range of complexity.



40 Hrs
4 CEU



Switchgear Maintenance

At the end of this four-day workshop, students will be able to perform startup, commission and preventive maintenance activities on various switchgear assemblies. Through classroom instruction and exercises, attendees will learn how to classify switchgear and its components. They will also discuss and identify nameplate ratings for circuit breakers and switchgear assemblies on actual equipment and learn how to properly maintain power circuit breakers and molded case breakers.



32 Hrs
3.2 CEU



Transformer Startup and Maintenance

The goal of this five-day workshop is to familiarize students with transformer styles, general startup procedures and necessary maintenance procedures. Through classroom instruction and exercises, attendees will learn how to perform commissioning and maintenance tests on unit substation and power transformers. Students will become familiar with transformer basics, including standard operating principles and standardized terminal markings, as well as the construction characteristics, inspections and tests of dry-type and liquid-immersed transformers.

Alternatively, we offer an eight-hour live online instructor-led course, students will be familiarized with transformer styles, general startup procedures and necessary maintenance procedures.



40 Hrs
4 CEU



8 Hrs
0.7 CEU



NFPA 70B

This class covers the NFPA 70B standard for electrical equipment maintenance, including guidelines and best practices. It helps users stay compliant with industry standards. Additionally, it will explore the specific requirements for maintaining different types of electrical equipment.

This course is offered in both Basic (1 Hr) and Advanced (4 Hrs) levels to suit different learning needs.



1 Hr
or
4 Hrs



1 Hr
or
4 Hrs



Fundamentals of Basic Relay Testing

Upon completion of this course, students will be able to test phase/ground time overcurrent (51) and phase/ground instantaneous overcurrent (50) protection elements on electromechanical and microprocessor feeder protection relays. The course covers abnormal conditions and overcurrent protection elements to prevent equipment damage and ensure safety. Students will also learn the functions of Current Transformer (CT) and Voltage Transformer (VT) ratios, polarity and operating principles as they apply to relaying, with hands-on reinforcement using various manufacturers' relays and demonstrations.



16 Hrs
1.5 CEU



**In-person
Instruction**



**Remote
Instruction**



eLearning



**Open
Enrollment**

Courses

Battery Safety and Maintenance

This course provides training for electrical or other personnel working in or planning to work in the battery sectors of industry that install, inspect and maintain batteries—either with or without battery experience.



1.25 Hrs

Transformer Startup and Maintenance

In this course, you will learn transformer basics such as standard operating principles and standardized terminal markings. It will also cover construction characteristics, inspections and tests of dry-type and liquid-immersed transformers.



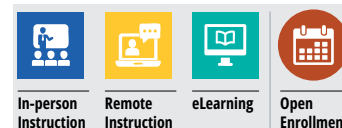
2.5 Hrs

Introduction to IR, Ultrasound, Partial Discharge and De-Energized Switchgear Testing

This in-depth 4-day training program is designed for professionals seeking knowledge and skills on energized and de-energized electrical equipment, including infrared thermography, ultrasound and partial discharge testing as required by NFPA 70B. The course focuses on data analysis, reporting processes and practical applications, making it ideal for electrical engineers, maintenance professionals and reliability engineers responsible for the operations and maintenance of electrical distribution systems. Whether you are new to these technologies or looking to refine your expertise, this training will provide valuable insights and practical skills to enhance your capabilities in the field.



32 Hrs





Power Distribution Equipment

What is a circuit breaker and what can it do for me? The Power Distribution Equipment training domain provides in-depth instruction on the operation, maintenance and troubleshooting of essential power distribution equipment, including transformers, switchgear and circuit breakers. These comprehensive training classes cover a wide range of topics, such as equipment theory, installation, maintenance, troubleshooting and adherence to safety procedures. Students will learn best practices for ensuring the optimal performance and reliability of equipment in their power distribution systems. By gaining hands-on experience and practical insights, students will be able to enhance the efficiency and safety of their power distribution equipment, ensuring the longevity and optimal performance of electrical systems.

This training domain is ideal for professionals in the electrical and adjacent industries, especially Engineers and Electrical & Maintenance Technicians. With a variety of classes available in both basic and advanced levels, students have the flexibility to customize their learning experience according to their skillsets. The program is designed to cater to a wide range of professionals, ensuring that everyone can benefit from the insights and skills gained.

Go to Training Domain



Course List

Automatic Transfer Switch

- Automatic Transfer Switch Overview
- Automatic Transfer Switch (ATS) Startup, Commissioning and Operation
- ATC-100 transfer switch controller
- Automatic Transfer Switch - ATC Controllers (Select from: ATC-300, ATC-600, ATC-800, ATC-900)
- Automatic Transfer Switches (Select from: Contactor type, Breaker type, Bypass type, Magnum type)

Busway

- Busway

Circuit Breakers

- Low Voltage Circuit Breakers (Select from: DSI, DSII, Magnum DS)
- Trip Units (Select from: PXR 10, PXR 20, PXR 25)
- Molded Case Circuit Breakers (Select from: Power Defense, Series C, Series G)
- Medium Voltage Circuit Breakers (Select from: VCP-W, VCP-T, VCPW-HD, VCP-WG)
- Magnum DS Switchgear and breaker Operation and Maintenance
- VCPW Switchgear and Breaker Operation and Maintenance

Fuses

- Fuses

Low Voltage Switchgear

- Low Voltage Switchgear (Select from: Arc Quenching Magnum PXR, Arc Resistant Magnum PXR, Magnum PXR)
- ARMS Maintenance Mode
- Zone Selective Interlocking
- Kirk Key Interlocks
- PLC Automatic Transfer Scheme
- Arc Quenching Switchgear
- High resistance Grounding

Motor Control Center

- Motor Control Center (Select from: FlashGard, Freedom)
- Freedom Motor Control Center operation and maintenance

Medium Voltage Motor Control

- Apmgard (Select from: SJA, SL)
- Medium Voltage Motor Control

Medium Voltage Switchgear

- Medium Voltage Switchgear (Select from: XGIS, IGX, VacClad)

Panelboards & Switchboards

- Pow-R Line Panelboards
- Pow-R Line Switchboards

Power Factor Correction Capacitors

- Active Harmonic Correction Unit (HCU) Overview

Relays

- E-Series Relay (Select from: EMR, EGR, ETR, EDR)

Reclosers

- Reclosers

Surge Protective Device (SPD)

- Surge Protective Device (SPD)

Starters

- Reduced Voltage Soft Starters (RVSS)

Transformers

- Oil Filled Substation Transformers

Variable Frequency Drives (VFD)

- Applied VFD Controls and Service - Basic

Featured Courses

Applied VFD Controls & Services

Abstract

PWM VFDs are unique electrical devices that utilize high speed switching technologies and power electronics that require a unique skill set in order to successfully apply control schemes and effective motor starting characteristics. Generally, there are two scenarios facing a VFD technician when installing or troubleshooting a VFD: Either you have specified drawings from an engineered solution, or you are applying a VFD into your application yourself. Both scenarios require the technician to fully understand the control capabilities of the drive and how the various internal systems function in order to troubleshoot them. Real world applications are used to implement basic open and closed loop control schemes. VFDs present electrical hazards and you will be shown safer methods of powering VFDs during troubleshooting as well as repair considerations and methods.

Course topics include

- VFD safety considerations
- Power terminal locations for Live-Dead-Live measurements
- Fundamentals of open and closed loop control schemes
- Entry level fieldbus communication for monitoring and control
- Control schematics and physical wiring of VFD I/O points.
- Selecting VFD applications for testing / tuning of open and closed loop systems.
- Fundamentals of troubleshooting VFD software and hardware faults / test and measurement instruments.
- Safe methods of powering and testing VFDs and repair options.



32 Hrs

Automatic Transfer Switch (ATS) Startup, Commissioning and Operation

Abstract

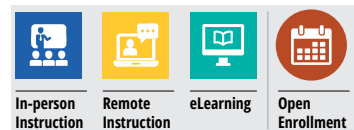
Using classroom instruction and laboratory exercises, attendees will learn about the transfer switch equipment that is currently manufactured by Eaton Corp. The classroom will have hardware demonstrators, including type ATC controllers, contactor-type switches and breaker-type switches. Hands-on activity will comprise at least half of the time spent in training activities. Attendees will meet key product line and support personnel. A plant tour will be included.

Course topics include:

- Transfer switch basics, including types of switches, codes and standards, as well as issues related to transfer switch operation
- Application considerations
- Operation and setup of current-production controllers
- Operation, startup and service of contactor type- and breakertype switches
- Operation, startup and service of the contactor-type, bypass/ isolation switches
- Operation, startup and service of Magnum DS-type switches, both standard TSE and bypass/isolation types



32 Hrs
3.2 CEU



Courses

Automatic Transfer Switch

Automatic Transfer Switch (ATS) Overview

This class provides an overview of Automatic Transfer Switch (ATS), including their functionalities and applications. Attendees will receive an overview of Automatic Transfer Switch requirements per the National Electric Code as well as learn the various types of switches used in commercial and industrial sites.



4 Hrs

Automatic Transfer Switch (ATS) Startup, Commissioning and Operation

This class covers the procedures for the startup, commissioning and operation of automatic transfer switches (ATS). It provides practical insights into preventing overvoltage-related issues. At the completion of this course, students will be able to perform startup, commissioning and maintenance activities on Eaton's current-production automatic transfer switches and controllers.

32 Hrs
3.2 CEU

ATC-100 Transfer Switch Controller

This course is for anyone who requires an understanding of the Eaton ATC100 Controller that is used in residential and light commercial applications and stand-by backup power systems. Topics include front panel interaction, how to navigate Load Test, No Load Test and set up Automatic Exercise. You will also learn how to set up the controller at installation and power up by setting nominal voltage, frequency and other basic timers. Troubleshooting basics is also discussed.



1 Hr

Automatic Transfer Switch - ATC Controllers

(Select from: ATC-300, ATC-600, ATC-800, ATC-900)

This class focuses on the features and applications of the ATC series controllers. It will provide detailed information on the programming and configuration of these controllers.



0.5 Hr

0.5 Hr

Automatic Transfer Switches

(Select from: Contactor type, Breaker type, Bypass type, Magnum type)

This class teaches the principles and applications of switches. It will cover the different types of switches and their specific uses in electrical systems.

This course is offered in both Basic (0.5 hr) and Advanced (4 hrs) levels to suit different learning needs.

0.5 Hr
or
4 Hrs0.5 Hr
or
4 Hrs

Busway

Busway

This class focuses on the basic features and applications of busway systems. It will provide insights into the design and installation of busway systems.



1 Hr

1 Hr

Circuit Breakers

Low Voltage Circuit Breakers

(Select from: DSI, DSII, Magnum DS)

This class covers the Low Voltage Circuit Breaker selected (DSI, DSII, Magnum DS), including features and applications.

This course is offered in both Basic (1 hr) and Advanced (4 hrs) levels to suit different learning needs.

1 Hr
or
4 Hrs1 Hr
or
4 Hrs

Courses

Trip Units

(Select from: PXR 10, PXR 20, PXR 25)

This class covers the PXR trip unit selected (PXR10, PXR 20, or PXR 25), including their features and applications. Additionally, it will explore the programming and configuration of these trip units.

This course is offered in both Basic (0.5 hr) and Advanced (1 hr) levels to suit different learning needs.



0.5 Hr
or
1 Hr



0.5 Hr
or
1 Hr



Molded Case Circuit Breakers

(Select from: Power Defense, Series C, Series G)

This class covers the Molded Case Circuit Breaker selected (Power Defense, Series C, Series G), including their features and applications. It will provide detailed information on the selection and installation of these circuit breakers.

This course is offered in both Basic (0.5 hr) and Advanced (1 hr) levels to suit different learning needs.



0.5 Hr
or
1 Hr



0.5 Hr
or
1 Hr



Medium Voltage Circuit Breakers

(Select from: VCP-W, VCP-T, VCPW-HD, VCP-WG)

This class covers the Medium Voltage Circuit Breaker selected (VCP-W, VCP-T, VCPW-HD, VCP-WG), including their features and applications. Attendees will learn their operational principles and the standards governing their use.

This course is offered in both Basic (0.5 hr) and Advanced (1 hr) levels to suit different learning needs.



0.5 Hr
or
1 Hr



0.5 Hr
or
1 Hr



Magnum DS Switchgear and Breaker Operation and Maintenance

This lesson is designed for those who own, operate and maintain Magnum DS Switchgear. The lesson will look at the layout and construction of Magnum DS Switchgear, operation and maintenance of Magnum DS Breakers and important accessories found with the switchgear.



4.5 Hrs

VCPW Switchgear and Breaker Operation and Maintenance

This course is designed for those who own, operate and maintain VCPW Switchgear. You will gain an understanding of the layout and construction of VCPW Switchgear, the operation and maintenance of VCPW Breakers and important accessories found with the switchgear.



2 Hrs

Fuses

Fuses

This class teaches the principles and applications of fuses in electrical systems.



1 Hr



1 Hr



High Resistance Grounding

High Resistance Grounding

This class focuses on the principles and applications of high resistance grounding in electrical systems, including benefits and implementation. It provides insights into the advantages of high resistance grounding.



1 Hr



1 Hr



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment

Courses

ARMS Maintenance Mode

This class focuses on the principles and applications of ARMS maintenance mode in electrical systems. Attendees will learn how to optimize the performance of ARMS maintenance mode in various applications.



Zone Selective Interlocking

This class teaches the principles and applications of zone selective interlocking in electrical systems. It will provide insights into the design and implementation of zone selective interlocking.



Kirk Key Interlocks

This class covers the features and applications of Kirk key interlocks in electrical systems.



PLC Automatic Transfer Scheme

This class focuses on the principles and applications of PLC automatic transfer schemes in electrical systems. It will provide insights into the design and implementation of PLC automatic transfer schemes.



Arc Quenching Switchgear

In this course you will learn how your lineup of Arc Quenching Switchgear works, what the primary components are and how to operate it. Eaton's low-voltage switchgear offers one of the most advanced arc flash safety solutions available.



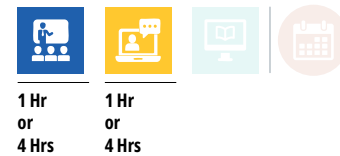
Low Voltage Switchgear

Low Voltage Switchgear

(Select from: Arc Quenching Magnum PXR, Arc Resistant Magnum PXR, Magnum PXR)

This class focuses on the functionalities and application of Low Voltage switchgear selected. It will provide insights into the design and installation of Low Voltage switchgear.

This course is offered in both Basic (1 hr) and Advanced (4 hrs) levels to suit different learning needs.



Motor Control Center

Motor Control Center

(Select from: FlashGard, Freedom)

This class covers the features and applications of Motor Control Centers (MCC).



Freedom Motor Control Center Operation and Maintenance

This course is designed for those who own, operate and maintain Freedom Motor Control Centers (MCC). The lesson will look at the layout and construction of Freedom Motor Control Centers, operation and maintenance of Freedom MCCs and their buckets and important accessories found with the Motor Control Center.



Courses

Medium Voltage Motor Control

Apmgard (Select from: SJA, SL)

This class covers the principles and applications of Apmgard Medium Voltage Motor Control Systems. It will provide insights into the design and installation of Apmgard Medium Voltage Motor Control Systems.



2 Hrs



2 Hrs



Medium Voltage Motor Control

This class covers the principles and applications of Medium Voltage Motor Control Systems.



2 Hrs



2 Hrs



Medium Voltage Switchgear

Medium Voltage Switchgear (Select from: XGIS, IGX, VacClad)

This class teaches the basic principles and applications of Medium Voltage switchgear. It will provide insights into the design and installation of Medium Voltage switchgear.



1 Hr



1 Hr



Panelboards and Switchboards

Pow-R Line Panelboards

This class focuses on the features and applications of Pow-R Line panelboards. It will provide detailed information on the selection and installation of Pow-R Line panelboards.



1 Hr



1 Hr



Pow-R Line Switchboards

This class covers the principles and applications of Pow-R Line switchboards. It will provide insights into the design and installation of Pow-R Line switchboards.



1 Hr



1 Hr



Power Factor Correction Capacitors

Active Harmonic Correction Unit (HCU) Overview

This class teaches the principles and applications of active harmonic correction units (HCU) in electrical systems.



1 Hr



1 Hr



Relays

E-Series Relay Familiarization

This class focuses on the basic functionalities of the E-series relays. It provides hands-on experience with relay testing equipment. Additionally, it will cover the programming and configuration of E-series relays. Attendees will learn how to optimize the performance of E-series relays in various applications



24 Hrs



1 Hr

In-person
InstructionRemote
Instruction

eLearning

Open
Enrollment

Courses

E-Series Relay

(Select from: EMR, EGR, ETR, EDR)

This class focuses on the basic functionalities of the E-series relays. Additionally, it will cover the programming and configuration of E-series relays.

This course is offered in both Basic (2 hrs) and Advanced (4 hrs) levels to suit different learning needs



2 Hrs
or
4 Hrs

Reclosers

Reclosers

This class covers the basic functionalities of reclosers. It will provide insights into the design and installation of reclosers.



1 Hr

1 Hr

Surge Protective Device (SPD)

Surge Protective Device (SPD)

This class teaches the principles and applications of surge protective devices in electrical systems, including selection and installation. It will provide insights into the design and implementation of surge protective devices.



0.5 Hr

0.5 Hr

Starters

Reduced Voltage Soft Starters (RVSS)

This class teaches the principles and applications of reduced voltage soft starters (RVSS) in electrical systems.



2 Hrs

2 Hrs

Transformers

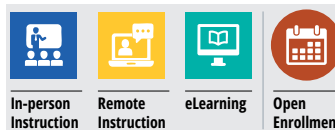
Oil Filled Substation Transformers

This class focuses on the features and applications of oil-filled substation transformers. It will provide insights into the design and installation of oil-filled substation transformers.



1 Hr

1 Hr



Courses

Variable Frequency Drives (VFD)

Applied VFD Controls and Service - Basic

PWM VFDs are unique electrical devices that utilize high speed switching technologies and power electronics that require a unique skill set in order to successfully apply control schemes and effective motor starting characteristics. Generally, there are two scenarios facing a VFD technician when installing or troubleshooting a VFD: Either you have specified drawings from an engineered solution, or you are applying a VFD into your application yourself. Both scenarios require the technician to fully understand the control capabilities of the drive and how the various internal systems function in order to troubleshoot them. Real world applications are used to implement basic open and closed loop control schemes. VFDs present electrical hazards and you will be shown safer methods of powering VFDs during troubleshooting as well as repair considerations and methods.



32 Hrs



In-person
Instruction



Remote
Instruction



eLearning



Open
Enrollment



Installed Systems

I just had a lineup of electrical equipment installed, now what? Installed Systems training provides an overview and functional training on the electrical systems installed at your site. Trainings are flexible and can be tailored to include topics such as system operation, integration, performance optimization and safety procedures. Participants will learn best practices for ensuring the efficient and reliable operation of their electrical systems. The program is manufacturer agnostic, ensuring that the training is relevant and applicable to your needs. Engage with a dedicated trainer to ask questions and ensure a thorough understanding.

This training domain is ideal for professionals in the electrical and adjacent industries, especially Electrical & Maintenance Technicians and Facilities Operators. The classes will be beneficial to those who will operate or interact with the electrical systems on a regular basis.

Maximize operational readiness and ensure seamless performance by integrating Installed Systems training with your Startup and Commissioning services. Contact us with your equipment lineup details!

Go to Training Domain





We make what matters work. *

* At Eaton, we believe that power is a fundamental part of just about everything people do. Technology, transportation, energy and infrastructure—these are things the world relies on every day. That's why Eaton is dedicated to helping our customers find new ways to manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. To improve people's lives, the communities where we live and work, and the planet our future generations depend upon. Because that's what really matters. And we're here to make sure it works.

See more at [Eaton.com/whatmatters](https://www.eaton.com/whatmatters)

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