

Basic Electricity

- Electrical Fundamentals
- Electrical Test Equipment for Everyday Use
- Understanding Your Building Electrical System
- Working Safely with Industrial Electricity
- The National Electrical Code® (NEC)
- Wire Selection
- Installing Wire (Conductors)
- Installing and Wiring Equipment
- Basic Troubleshooting Techniques

Electrical Troubleshooting

- Basic Skills
- Control Circuits
- Motors
- Power Distribution
- Power Quality Problems
- Lighting Circuits
- Programmable Logic Controllers
- Variable Frequency Drives (VFDs)
- Electrical Preventative Maintenance

ELECTRICAL TRAINING

Basic Electricity & Electrical Troubleshooting



"...great discussions of real on the job type situations."

Daniel W. - Maintenance Supervisor

2-Day Courses for Everyday Building, Plant and Facility Maintenance



Created to bring students up to speed as quickly and safely as possible

Can be adopted as part of your regular Qualified Electrical Worker program

- Reserve your space now! **CALL 1-877-978-7246**
- Check us out online at live.tpctraining.com for a complete listing of all seminars coming to your area
- This seminar is also available as an **Online Simulcast** or can be brought **On-Site** to your facility

WHAT YOU WILL TAKE HOME

- A laminated, full-color TPC Training Reference Guide detailing all the “must-know” information covered in the class. Keep this with you while on the job for immediate knowledge recall.
- Comprehensive classroom materials
- A Personalized Training Certificate with 0.8 TPC Training Continuing Education Units for each day attended, 1.6 for both days.
- All the information you need from asking our instructors specific questions about your own unique equipment or facility.

CONTINUING EDUCATION

For simulcasts and classroom instructor-led, live courses, the student will receive a three-star certification of completion showing 8 classroom hours (.8 TPC Training CEUs) per day attended. Most employers and many government agencies accept TPC Training CEUs to fulfill their continuing education requirements. TPC Training also offers CEUs toward state license renewal, which are accepted by over 90 electrical, water, HVAC, and professional engineering state licensing agencies. CEU availability and the CEUs earned per course varies by each state licensing agency. For more information about live CEUs and state licensing agencies, call 303-867-5039.

▶ “The most practical course I’ve ever taken. This seminar was excellent!”

Jim M. - Maintenance

▶ “Having been disappointed by other seminars, I was pleasantly surprised by this outstanding presentation.”

Tom O. - Electrical Engineer



Basic Electricity for the Non-Electrician™

SEMINAR OVERVIEW

This electrical training course was created to bring students up to speed in their knowledge of basic electricity as quickly and safely as possible. It includes hands-on skills improvement and is specifically designed for maintenance technicians and other non-electrical personnel working in industrial plants and commercial buildings. In this course, students are immersed in practical, real world examples that illustrate how electricity is distributed and used in their plants and facilities. It is also a great refresher for experienced electricians and engineers. It provides a practical, real world electrical education. Students’ specific needs and concerns are addressed during the class so that they can go back to their workplace and immediately apply what they’ve learned.

This course can also be adopted as part of a company’s regular Qualified Electrical Worker program.

DISCUSSION TOPICS

Electrical Fundamentals

- Production & Distribution of Electricity
- DC and AC in Plants and Facilities
- Voltage, Current and Resistance; Ohm’s Law
- Basic Electric, Series, and Parallel Circuits
- Power: Types & Control
- Single-phase and Three-phase Systems
- Workplace Electrical Safety

Electrical Test Equipment for Everyday Use

- Multimeters, Voltage Testers, and Ammeters
- De-energized Circuits
- Modes of Failure
- Megohmmeters
- Meters for Special Circumstances

Understanding Your Building Electrical System

- Reading Electrical Single-Line Diagrams
- Major Components
- The Electrical Service
- Main Distribution Centers
- Transformers, Feeders, Disconnects, & motors
- Switchgear and Circuit Breakers
- Overcurrent Protective Devices
- Panelboards, Branch and Lighting Circuits
- Electrical Floor Plans & Facility Wiring

Working Safely with Industrial Electricity

- Hazards & Dangers of Electricity
- Personal Protective Equipment (PPE)
- Lockout/Tagout (LOTO)
- Developing Safe Work Practices

The National Electrical Code® (NEC)

- Purpose and Overview
- Important Definitions and Terminology
- Overview of Installation Requirements
- “Qualified Persons”

Wire Selection

- Conductor Types & Materials
- Selection of Wire Insulation
- Sizing the Wire for the Job

Installing Wire (Conductors)

- Raceways, Cable Trays, Conduits, Fittings and Boxes

Installing and Wiring Equipment

- Wire Nuts, Terminals and Crimpers
- Switches and Receptacles
- Fluorescent Ballasts
- Motors
- Temporary Wiring

Basic Troubleshooting Techniques

- Branch and Control Circuit Problems
- Isolation of Components
- Checking & Replacing Fuses

Electrical Maintenance Activities

- Assured Equipment Grounding Program
- Use and Operation of GFCI’s
- Types of Electrical Maintenance
- Special Precautions

“Hands-On” Electrical Troubleshooting & Preventive Maintenance™

SEMINAR OVERVIEW

Working with real world components and instruments found at their facility, attendees in this “hands-on” course will learn how to fix electrical problems. It was created to bring students up to speed in their electrical troubleshooting skills as quickly and safely as possible and designed to cover the more commonly performed electrical troubleshooting tasks a maintenance technician faces in his job every day. For the novice or experienced electrician, this training course provides a no-nonsense, practical and real world systematic approach to electrical troubleshooting. This course can also be adopted as part of a company’s regular Qualified Electrical Worker program.

This 2-day seminar is just \$1100. You can also combine it with our Advanced Electrical Troubleshooting course for a comprehensive 4-day Electrical Workshop.

DISCUSSION TOPICS

Basic Skills for Electrical Troubleshooting

- Safety First
- OSHA Requirements Regarding Troubleshooting and Qualified Persons
- Using Electrical Drawings for Troubleshooting
- Using Meters to Perform Circuit Measurements
- Logical, Systematic Approaches to Troubleshooting

Troubleshooting Control Circuits

- Building a Circuit from a Ladder Diagram
- Control Circuit Industrial Applications
 - Control Relay Logic Circuits
 - Automatic Motor Control Circuits
 - Timer Sequence Circuits
- Testing Field Components
 - Control Relays
 - Motor Starter Contactors
 - Overload Devices
 - Solid State Timers
 - Limit Switches
 - Auxiliary Contact Blocks
 - Indicator Lamps
 - Push Buttons & Selector Switches
 - Circuit Breakers and Fuses

Troubleshooting Motors

- Most Common Motor Problems
- Electrical and Mechanical Concerns
- Performing Electrical Tests on a Motor
- Using the Megohmmeter on a Motor
- Testing for Shorts, Opens and Ground Faults
- Phase Unbalance and Rotation Testing
- Forward/Reverse Motor Starters

Troubleshooting Power Distribution

- Wye and Delta Systems
- Overcurrent Protection
- Checking and Replacing Fuses
- Branch Circuits

Power Quality Problems

- Sources of Power Quality Problems
- Test Equipment for Power Quality Problems
- Harmonics
- Phase Unbalance

Troubleshooting Lighting Circuits

- Lighting Terminology
- Types of Lighting Circuits
- Incandescent, Fluorescent, HID, and LED Lighting

Troubleshooting Programmable Logic Controllers

- Overview of PLCs and Components
- Reading PLC Ladder Diagrams
- Status Indicators and Error Codes
- Force and Disable
- Startup Procedures

Troubleshooting Variable Frequency Drives (VFDs)

- VFD Terminology and Basic Operation
- Components
- Common Problems & Corrective Action

Electrical Preventative Maintenance

- Overview of an Electrical Maintenance Program
- Building Your Own Inspection Checklist

BRING THE TRAINING ON-SITE TO YOUR FACILITY

live.tpctraining.com/on-site

TPC Training conducts hundreds of on-site trainings at customer facilities each year. Every public seminar class in our Course Catalog can be conducted on-site, with the same expert instructors. To arrange an on-site training, call or email us at onsite@tpctraining.com.

On-site training is also available in a Live Simulcast Seminar format, allowing teams in multiple facilities to join live training via a web connection. This is an excellent option for overseas facilities and geographically dispersed teams.

Advantages of On-Site Training

- Less Lecture – Our courses deliver targeted training tasks relevant to daily work.
- Cost Savings — The larger the group, the more you save. You also save time and travel costs by keeping workers onsite.
- Customized Content — The instructor can tailor the seminar to your facility, including discussion of your specific equipment.
- Flexibility — Our training can accommodate multiple shifts and different start and end times.
- Best Results — On-site training combines the knowledge retention of live training with the ability for workers to learn in their own environment.

Contact us if you have any questions and to get a no-obligation quote.

▶ *“...full of useful information that pertains to what i do at my job.”*

Ian A. - Engineering Technician

▶ *“All questions answered... great depth of information. Time and money well spent.”*

Robert E. - Maintenance Engineer

Daily Schedule

7:30 am Registration
8:00 am Class Begins
12:00 -1:00 pm Lunch
4:30 pm Class Ends

Is Live Training Right for You?

Our intensive courses, held in 100+ cities, on-site at our customers' facilities, and online via simulcast, are simply the best way to gain, refresh, and advance essential maintenance skills quickly and apply them in the workplace.

What makes our live training different?

1. Personalization – Our classrooms are dynamic environments with small class sizes, allowing students to discuss the needs, challenges, and equipment in their own workplace.
2. Expertise – Our team of more than 60 expert instructors is the most seasoned in the industry, with more than 200,000 classroom hours between them, plus deep field experience.
3. Participation – We employ demonstrations, problem-solving exercises, teaching aids, and in some courses, hands-on equipment to enhance engagement and practical skill acquisition.
4. Reliability – All of our seminars, on-sites, and simulcasts are backed by our Money Back Guarantee, so you can book with confidence that we'll deliver the training outcomes you need.

Training Philosophy

TPC Training's curriculum is designed to provide complete coverage of essential industrial maintenance skills, across a full range of electrical training, HVAC, plant management, and mechanical & industrial topics. Our "see, touch, do" instructional approach allows us to impart practical skills in an intensive format.

The most vital part of our seminar format is the coverage that goes beyond the course outline. Our small class sizes allow each instructor to tailor the course to address students' individual needs, concerns, and experience levels. Our instructors deliver content with hands-on exercises, demonstrations role-playing, visuals, and case study discussions.

About Our Instructors

Our team of 60 field-experienced instructors is the backbone of training seminar schedule, from HVAC certification and maintenance to PLC courses. Together they've logged more than 200,000 hours in the classroom — by far the deepest experience in the industry.

All of our instructors must meet three core requirements:

1. Relevant formal education in the seminar topic area
2. Documented hands-on work experience in their area
3. Specific experience as a maintenance training instructor

Many of our instructors' credentials extend even further, including experience as authors, speakers, and industry organization board members within their fields of expertise. And they stay current on technology and industry trends through their own ongoing education, field visits, and peer review meetings.

The result of our emphasis on instructor quality is a consistently high standard of delivery across all of our 2000+ annual seminars. Workers leave our seminars ready to apply what they've learned to make an immediate impact at their jobs.

No Risk Registration & Money Back Guarantee

Not sure whether you or your employees will be able to attend an upcoming seminar? You can reserve your space in the class at any time and cancel without penalty. Cancellations made more than 14 days prior to the seminar may be refunded or rescheduled. Cancellations made within 14 days may be rescheduled for any future topic and/or date.

Not sure which employees you'll send for training? You can also freely make substitutions among attendees up to the time of the seminar.

Phone: 1-877-978-7246

Website: live.tpctraining.com

Fax: (303) 531-4565

E-mail: customerservice@tpctraining.com

Mail: TPC Training, P.O. Box 3397, Englewood, CO 80155

Join our classroom seminars from virtually anywhere. Attend online: live.tpctraining.com/simulcast



TPC Training is proud to extend our legacy in instructor-led maintenance training to web-based learning with our new, industry-first **simulcast** seminars. Our simulcast option allows students to connect to a live classroom seminar via a web link, with the ability to participate fully in the classroom dialogue, exercises, and Q&A. Online participants get all the benefits of the full classroom experience, plus the convenience of remote access.

Can't leave the worksite? We've got you covered. Can't find a classroom seminar that fits your location and schedule? A simulcast is ideal for you.

Features include:

- Two full days of live, interactive instruction from a TPC Training instructor
- All classroom materials in PDF format
- Certificate of completion for 16 hours of live training
- Full technical support to ensure your online experience is as rewarding as being in the classroom

Register now for:

- Air Conditioning and Refrigeration
- Basic Electricity for the Non-Electrician
- Boiler Maintenance and Safety
- Chilled Water Systems
- Arc Flash Electrical Safety NFPA 70E®
- General Maintenance
- Generators and Emergency Power
- High Voltage Electrical Safety Training
- HVAC Electrical Controls & Air Distribution
- Understanding and Troubleshooting Hydraulics
- Motors, Drives and Control Circuits
- National Electrical Code®
- Photovoltaic Solar Power
- Predictive Maintenance
- Effective Maintenance Planning and Scheduling
- Pump Repair and Maintenance
- Electrical Ladder Drawings, Schematics & Diagrams
- Troubleshooting Essentials