

For a schedule of open enrollment classes or to bring this training to your plant or facility, contact us @

1-877-97-TRAIN

www.AmericanTrainco.com



# “Hands-On” Basic Electricity for the Non-Electrician™

Specifically Designed for Maintenance Technicians and Other Non-Electrical Personnel Working in Industrial Plants and Commercial Buildings

▶ *"The most practical course I've ever taken. This seminar was excellent!"*

Jim Monteith - Maintenance  
Gorham House

**College Credit & Testing Available with this Course**

This course now carries American Council on Education (ACE) College Credit Recommendations.

**Day 1- Understanding Industrial Electricity**

**Day 2- Working with Industrial Electricity**

- New Convenient Format - Attend either one or both days!
- This seminar can also be presented at your facility for larger groups
- Reserve Your Space Now! **CALL 1-877-97-TRAIN**
- Check us out online at **www.AmericanTrainco.com** for a complete listing of all seminars coming to your area

▶ *"A+...Superb!"*

Tamas Tribolt - Maintenance Mechanic - Reliant Energy

**"Time and money well spent!"**

Robert L. Ecklund - Process Technician  
Essilor Of America

**"I'll be able to apply what I've  
learned just about every day!"**

Kenneth Justman - Maintenance Technician  
Arizona Public Service

**"An eye opener... wish all my  
co-workers could attend"**

Donald Sigler - Maintenance Mechanic  
Harrah's Casino

# Basic Electricity for the Non-Electrician™

## PURPOSE OF TRAINING

This course is designed for anyone who needs to understand basic electricity in order to improve efficiencies and uptime at their industrial plants and large building facilities. We approach our students as if they were our own employees, giving them a real world "hands-on" electrical education. When students are finished taking this course they will be able to go back to their workplace and **immediately** apply what they have learned.

## TRAINING OUTCOMES

During this seminar your employee will perform the following basic electrical "hands-on" maintenance tasks. When they return from this American Trainco seminar, you can expect your employee to present you with a training certificate and checklist indicating he or she has successfully completed the following:

### (After Day 1)

1. Safely and correctly verify a circuit is de-energized.
2. Take voltage and resistance readings using a digital multimeter.
3. Take clamp-on ammeter readings.
4. Perform checks for shorts, opens and ground faults.
5. Be ready to read and interpret your facility one-line electrical drawings and electrical floorplans.

### (After Day 2)

1. Choose what electrical PPE to wear for what job.
2. Choose the right type and size wire for common electrical jobs.
3. Determine number and size of wires they can pull into a given type and size conduit.
4. Terminate and splice, control, lighting and power circuit wiring using compression terminals and twist-on wire connectors.
5. Wire devices such as switches and receptacles.
6. Make the electrical checks required as part of an Assured Equipment Grounding Conductor Program as required by OSHA and the NEC®.

## LEARNING OBJECTIVES

### Attendees will learn to:

1. Understand how electricity is produced and distributed.
2. Know the difference between AC and DC.
3. Identify the relationship between voltage, current and resistance.
4. Use Ohm's Law wheel to determine electrical values.
5. Understand the three hazards of electricity.
6. Understand electrical power and power measurement.
7. Identify characteristics of 3 basic electrical circuits.
8. Identify the types and characteristics of commonly used electrical test equipment.
9. Understand how electricity is distributed through commercial and industrial facilities.
10. Understand industrial electrical terminology.
11. Read basic electrical distribution diagrams.
12. Identify PPE required for various electrical tasks.
13. Understand the importance of Lockout/Tagout.
14. Understand the purpose of the National Electrical Code and its relationship to maintenance tasks.
15. Define basic electrical terms found in the NEC®.
16. Identify general requirements of the NEC®.
17. Identify properties of the different types of conductors and insulation materials.
18. Read and interpret NEC® Table 310.16 reproduced in the Ugly's manual to size wire.
19. Identify different types of raceways for wiring.
20. Identify the correct methods to wire various electrical components and equipment.
21. Troubleshoot using a systematic approach.
22. Understand the importance of an Assured Equipment Grounding Conductor Program and the use of GFCI's.
23. Understand the basic types of electrical maintenance performed in industrial plants and facilities.

## ABOUT OUR INSTRUCTORS

All American Trainco instructors are required to have a formal education and real world work experience. They need to be leaders in their field. We don't hire field people without teaching experience, and we don't hire teachers without field experience. They must have both. And since attendees critique the instructor at the end of each class, a positive and enjoyable learning experience is virtually guaranteed.

## WHO SHOULD ATTEND

This course is designed for anyone who needs to understand basic industrial electricity in order to improve efficiencies and safety at their industrial plants and large building facilities. Attendees come from a wide variety of industries, skill-levels, company sizes, and job titles, so if you're not sure you'll fit in or will benefit from the class, don't worry - you will - as long as you work with electricity! People who will benefit from attending this seminar include...

### All Maintenance Personnel in:

**Manufacturing Plants**    **Commercial Buildings**  
**Hospitals**    **Waste Water Facilities**  
**Schools**    **Government Buildings**  
**Research Facilities**    **Shopping Centers**  
**Apartment Buildings**

### Including:

**Mechanics**    **HVAC Technicians**  
**Machine Operators**    **Apprentices**  
**Alarm Technicians**  
**Non-Electrical Engineers**  
**Building Engineers**    **Stationary Engineers**  
**Low Voltage Specialists**  
**Multi-craft & Cross Training Personnel**

## CERTIFICATES-TESTING-COLLEGE CREDIT

After completion of this seminar students will receive a Certificate of Completion and 1.6 CEUs (Continuing Education Units) approved by the Maintenance Training Association of the Americas. Students may also elect to take the MTAA Certification test associated with this topic. Those seeking college credit recommendations must attend both days of this course and successfully pass the MTAA Certification test. This course is recommended by ACE for 1 college credit hour. Transcripts are available through American Trainco.

**"I walked out with an  
interest in living longer."**

Bill Gabriele - Building Engineer  
AAOMS

## Day 1

### Understanding Industrial Electricity

This seminar will provide students with a basic understanding of how electricity works in commercial and industrial settings. Starting with easily understood analogies to explain the fundamentals of electricity, students will then be quickly immersed in practical, real world examples used to illustrate how electricity is distributed and used in their own plants and facilities. Next they will learn about different types of electrical test equipment and how to use this equipment in their everyday jobs. A short introduction to electrical safety will be included before moving on to an in-depth discussion about major electrical components such as motors and transformers, where & how these components work, and their purposes within electrical systems. By the end of Day 1, students will have gained a firm understanding of how electrical systems work in their own plants and buildings.

#### DISCUSSION TOPICS – DAY 1

##### Electrical Fundamentals

- Production & Distribution of Electricity
- DC and AC in Plants and Facilities
- Voltage, Current and Resistance; Ohm's Law
- Basic Electrical Circuits
  - Series Circuits
  - Parallel Circuits
  - Series / Parallel Circuits

- Power: Types & Control
- Single-phase and Three-phase Systems
- Workplace Electrical Safety

##### Electrical Test Equipment for Everyday Use

- Multimeters
- Voltage Testers
- Verifying a Circuit is De-energized
- 3 Modes of Failure: Opens, Shorts & Ground Faults
- Clamp-on Ammeter
- Megohmmeters
- Meters for Special Circumstances

##### Understanding Your Building Electrical System

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

## Day 2

### Working with Industrial Electricity

The second day of this seminar consists of the real world, everyday electrical tasks performed on the job. Students will receive an NFPA 70E electrical safety overview followed by a brief introduction to the National Electrical Code® and how the NEC® pertains to the electrical work they do. Next they will learn how to choose the right materials for the job and how to perform basic electrical repairs and installations. A discussion on proper wiring of equipment will be followed by practical tips for electrical troubleshooting, before ending the day with an overview of other common electrical work activities including an introduction to preventive maintenance practices. By the end of Day 2, students will have gained a solid foundation for safely performing electrical work in their plants and facilities.

#### DISCUSSION TOPICS – DAY 2

##### NFPA 70E Electrical Safety

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

##### The National Electrical Code®

- 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 & Wiring Equipment

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

##### Basic Troubleshooting Techniques

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

##### Electrical Maintenance Activities

- Performing Checks as part of an Assured Equipment Grounding Program
- Use and Operation of GFCI's
- Types of Electrical Maintenance
- Special Precautions

## HIGH QUALITY PRESENTATIONS

From the start we've demanded that all our presentations would be lively, attractive, crisp and clear. Our instructors use state-of-the-art computers, projection equipment and software to bring you a high quality visual experience.

## SEMINAR AGENDA

|                |                     |
|----------------|---------------------|
| 7:30 am        | Registration        |
| 8:00 am        | Class Begins        |
| 12:00 -1:00 pm | Lunch (on your own) |
| 4:30 pm        | Class Ends          |

## SEMINAR FEES

\$490 Each Day    \$980 Both Days

## NO RISK REGISTRATION & MONEY-BACK GUARANTEE

If you're not yet sure you'll be able to attend this seminar, you can still make a reservation to hold your space in class. While payment is due prior to the start of the seminar, you may choose a full refund or credit for cancellations made at least 24 hours in advance. Student substitutions can also be freely made at any time prior to the start of the seminar. Refunds will not be issued for registered attendees who fail to show up and have not given a notice of cancellation. In the rare event that should you not receive the expected value after attending our seminar, simply notify us in writing of your reasons and your money will be promptly refunded.

## IN-HOUSE TRAINING

You can bring this or any other maintenance training program directly to your plant or facility. Call **1-877-97-TRAIN** and ask for Dan or Adam, or email [AdamC@AmericanTrainco.com](mailto:AdamC@AmericanTrainco.com), or visit us on the web at [www.AmericanTrainco.com](http://www.AmericanTrainco.com)

**Some of the other training topics we can bring to your site include:**

- **Basic Electricity for the Non-Electrician™**
- **Electrical Troubleshooting**
- **Air Conditioning & Refrigeration**
- **Boiler Operation, Maintenance & Safety™**
- **Arc Flash Protection & Electrical Safety™**
- **2008 National Electrical Code®**

**And 20+ other courses in the following areas:**

- **Electrical / Electrical Controls**
- **HVACR**
- **Mechanical**
- **Facility & Plant Management**
- **Fluid Power**
- **Pumps / Piping**
- **Codes / Standards / Safety**

Reserve Your Space Now!

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Or Online at: [www.AmericanTrainco.com](http://www.AmericanTrainco.com)

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**"The best seminar I have ever been to...a true value!"**  
 Tom Strotman - Park Maintenance  
 City of Midwest City

**Specifically Designed for Maintenance Technicians and other Non-electrical Personnel**

**SEMINAR FEE**  
**\$490 Each Day \$980 Both Days**

**FIVE EASY WAYS TO REGISTER:**

- 1) **Internet** [www.AmericanTrainco.com](http://www.AmericanTrainco.com)
- 2) **Fax** (303) 531-4565
- 3) **Phone** Toll Free 1-877-97-TRAIN 1-877-978-7246 or (303) 531-4560
- 4) **Mail** this form to: American Trainco, Inc. P.O. Box 3397 Englewood, CO 80155
- 5) **E-mail** the information requested on this form to: [Sales@AmericanTrainco.com](mailto:Sales@AmericanTrainco.com)

**Authorizing Person/Supervisor:** Name \_\_\_\_\_

Title \_\_\_\_\_ Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

| Seminar Attendees: | Name | Title | E-Mail | Seminar City |
|--------------------|------|-------|--------|--------------|
|                    |      |       |        |              |
|                    |      |       |        |              |
|                    |      |       |        |              |
|                    |      |       |        |              |
|                    |      |       |        |              |

| ATTEND                   |                          |                          |
|--------------------------|--------------------------|--------------------------|
| Day 1 Only               | Day 2 Only               | Days 1 & 2               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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**Billing Information:** (Please fill out this section only if the "Bill To" name and address is different than the Authorizing Person's name and address above.)

|                   |       |              |
|-------------------|-------|--------------|
| Individual's Name | Title | Company Name |
| Address           | City  | State Zip    |
| Phone             | Fax   | Email        |

**Payment Method:**

- Visa
- MasterCard
- Discover
- American Express
- Check Enclosed
- Bill Purchase Order #:

Card Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

Name on Card: \_\_\_\_\_

Signature: \_\_\_\_\_

(Make payable to: American Trainco, Inc.)

## GOT A LARGE GROUP?

### BLOCK PURCHASING PROGRAM

Buy your training in bulk and save up to 25%! This program can be used to register any person for any seminar, at any location and for any date.

### ON-SITE TRAINING

Bring any of our seminars directly to your site. The more people you have, the greater the savings!

*Call*

**1-877-97-TRAIN**



PO Box 3397  
 Englewood, CO 80155



PROMOTION CODE

**X05**