

Advanced Industrial Hydraulics
Advanced Industrial Pneumatics
Arc Flash Electrical Safe Work Practices (ESWP)
Basic Electricity for Mechanics
Basic Industrial Hydraulics
Basic Industrial Pneumatics
Bearing Maintenance & Fundamentals
Electrical Print Reading
Fall Protection
Fluid Power Fundamentals
HVAC Air Conditioning &
Refrigeration Fundamentals
Hydraulic Troubleshooting
Lockout Tagout
Lubrication Technology
Motors & Drives Fundamentals
Power Transmission Technology
Pumps & Seals
Rigging
Root Cause Failure Analysis
Technical Troubleshooting
PLUS: Custom Courses & Apprenticeship Programs



Maintenance Professionals Deliver Uptime

How Much Does Downtime Cost?

In Fortune 500 companies, one minute of downtime costs approximately \$23,000, according to *Fortune* magazine. Better trained employees solve problems faster, adding directly to your bottom line.

Recruit and Retain Good Employees

An investment in training also means more qualified and satisfied employees. With our skilled workforce aging and about to retire, how will you train current and new maintenance professionals?

Count on MaintenancePRO® Training. MaintenancePRO® courses offer practical training on maintenance, troubleshooting, component application and failure analysis. MaintenancePRO® also provides:

- Product information about the components in use at your facility
- Most classes combine lecture with valuable hands-on training labs
- Courses can be held on-site at your facility
- World-class technical documentation and reference materials
- Highly qualified instructors who are experts in their fields
- Pre- and post-course assessments to evaluate the learning gain of the class
- No manufacturer bias
- Certificate of completion and achievement
- Courses available in Spanish



Who should attend?

MaintenancePRO® is for maintenance repair professionals. It is the best available technical training on the systems, components and equipment that you use. Training topics include maintenance, troubleshooting, component application and failure analysis.

Recommended Audience:

- Maintenance personnel and supervisors
- Millwrights
- Machine repair specialists
- Mechanics
- Plant engineering personnel
- Electricians

How do I register for a MaintenancePRO® Technical Training Course?

Phone: Call your local Applied® service center at 1-877-279-2799 or the MaintenancePRO® Hotline at 1-866-664-5733 (8:00 a.m.–5:00 p.m. EST).

Fax: Complete a Class Registration form (available through www.Applied.com/maintenancepro) and fax it to 1-877-716-0931.

E-mail: Send your request to applied@maintpro.com, and one of our MaintenancePRO® course administrators will contact you.

How about class confirmations and cancellations?

A class confirmation notice will be mailed or e-mailed to you upon registration at least (per seat) week prior to the date of the class.

Standard Courses: If you are unable to attend a class and provide a 14-day prior notice, you will be charged a \$50 cancellation fee (per seat). Cancellation notices received within 14 days of the class date are subject to a \$250 cancellation fee. No-shows will be assessed the full class tuition.

On-Site Courses: All cancellations are subject to a \$250 fee. If the course is cancelled within two weeks of the scheduled date, the customer is also responsible for all costs associated with cancellation (varies by course and location).

Unique Training for Your Unique Needs

Your company's maintenance needs, job skills and plant equipment are all unique. To be most effective, your training should also be customized.

The courses listed in this catalog are only a brief representation of the training available through MaintenancePRO®. We routinely customize individual courses and programs based on:

- Content
- Specific job needs
- Skill/experience level
- Equipment brand or type
- Your unique plant set-up

Some of the topics we cover include:

- Basic job skills
- Bearings
- Electronics
- Equipment troubleshooting
- Fluid power
- Linear technology
- Lubrication
- Motors & drives
- Power transmission
- Safety
- Welding
- And much more — ask us about your training requirements!



Apprenticeship Programs

As our skilled workforce ages, training skilled apprentices is becoming more of a critical need. We routinely design and implement customized apprenticeship training programs, bringing workers up to speed quickly in key areas. These programs are particularly popular for electrical, millwright and mechanical trades; however, custom MaintenancePRO® apprenticeship programs can be designed for just about any profession or skill. As with any custom course, apprenticeship programs are tailored to your specific job needs, plant and equipment, and training sessions may be scheduled any time and in almost any location.

For more information, please contact David Lester, Director of Training, at (304) 534-3367 (office), (304) 612-0700 (cell) or dlester@applied.com.

MaintenancePRO® Achieves What Local Colleges Can't

When a large metropolitan area's harbor department/seaport needed training, they started by calling local educational institutions. They found that the offering was very limited. Community colleges presented a canned, "textbook" approach. Additionally, the pace of training was too drawn out and did not meet the seaport's requirement to train workers quickly. Trade schools were mostly set up to get graduates into jobs, not advance in them.

What they really wanted was a hands-on program that incorporated real-world issues and, when possible, used the seaport's own equipment. And they found it through MaintenancePRO®.

Custom MaintenancePRO® courses were a perfect fit for the seaport's training requirements and timelines. And, our trainers brought the program directly to the busy seaport's workers.

MaintenancePRO® training professionals customized a number of courses for the seaport, including *Industrial Pneumatics*, *Industrial Hydraulics*, *Power Transmission Technology*, *Welding* and *Paint & Spray Technology*. Whenever possible, the seaport's equipment and blueprints were utilized.

Once the customer realized the benefits of rapidly training a workforce, additional courses were requested.

Advanced Industrial Hydraulics

MP-10003

Duration: 16 hours

This course covers hydraulic components and systems as well as the design of hydraulic circuits. *Advanced Industrial Hydraulics* is ideal for personnel involved in the basic maintenance and repair of hydraulic equipment.

Benefits of this training include the ability to:

- Replace hoses, seals and fittings
- Describe preventive maintenance actions, such as removing, replacing and cleaning common hydraulic components
- Respond quickly to equipment and system failures
- Troubleshoot common hydraulic components

Advanced Industrial Pneumatics

MP-10005

Duration: 16 hours

Advanced Industrial Pneumatics reviews pneumatic power theory, fluid system components, pneumatic circuits and safety practices for handling pneumatic equipment. It is an excellent course for personnel involved in the basic maintenance and repair of pneumatic equipment.

Benefits of this training include the ability to:

- Minimize failures in pneumatic equipment, thus reducing downtime and cost
- Describe pneumatic power and the components used in the design of pneumatic systems
- Respond quickly to equipment and system failures
- Use the knowledge gained to maintain and repair pneumatic equipment and controls
- Explain common circuit applications

Arc Flash Electrical Safe Work Practices (ESWP)

MP-10014

Duration: 8 hours

An excellent safety course, *Arc Flash Electrical Safe Work Practices (ESWP)* covers many issues and standards as specified by OSHA and NFPA. Topics covered include portable equipment use, PPE requirements, working on energized equipment, OSHA lockout requirements, the approach distance concept, energized work, voltmeter and ammeter use, personal protective equipment, personal safety grounding, bus plug-in and busway, and switching.

Benefits of this training include the ability to:

- Remain safe while performing plant electrical applications
- Understand how to properly use testing equipment
- Minimize accidents by properly using personal protective equipment

Basic Electricity for Mechanics

MP-10020

Duration: 8 hours

This course covers the fundamentals of electricity for workers in a mechanical role. We cover basic electrical laws, both AC and DC, as well as fundamental information on conductivity, current, resistance, circuitry, voltage, magnetism, capacitance and more. Also emphasized are basic safety practices, as well as various types of multimeters (electrical measuring devices).

Benefits of this training include the ability to:

- Use electrical terminology
- Demonstrate the proper safety practices for electrical jobs
- Describe AC and DC laws and circuits
- Use electrical measuring devices such as analog meters, voltage testers, ohmmeters, ammeters and megohmmeters

Basic Industrial Hydraulics

MP-10002

Duration: 8 hours

An excellent overview for maintenance personnel, this course covers basic industrial hydraulics, including theory, component operation and hydraulic circuits.

Benefits of this training include the ability to:

- Minimize failures in hydraulic equipment, thus reducing downtime and cost
- Perform regular preventive maintenance on hydraulic equipment and systems
- Interpret ANSI symbols and drawings to explain the functions of specific hydraulic systems
- Use the knowledge gained to maintain hydraulic equipment and controls

Basic Industrial Pneumatics

MP-10004

Duration: 8 hours

Basic Industrial Pneumatics covers pneumatics theory, component operation and circuits. It is ideal for professionals involved in the basic maintenance of pneumatic equipment.

Benefits of this training include the ability to:

- Interpret ANSI symbols and drawings to explain the functions of specific pneumatic systems
- Describe basic preventive maintenance actions
- Respond quickly to equipment and system failures
- Use the knowledge gained to maintain pneumatic equipment and controls
- Troubleshoot basic pneumatic components



Avoid Safety Risks, Fines and Downtime!

Pair your Arc Flash training with Electrical Survey and/or Safety Labeling services from **Applied Industrial Technologies**. Bring your plant up-to-date with current OSHA and NFPA70e requirements – while arming your workers with valuable electrical knowledge too! For details, visit www.Applied.com/electricalsafety.

Bearing Maintenance & Fundamentals

MP-10007

Duration: 16 hours

An excellent summary course, *Bearing Maintenance and Fundamentals* reviews the different types, applications, maintenance, repair, installation and failure analysis for many of the most common types of bearings used in the industry today. It is recommended for personnel involved in the basic maintenance and repair of bearings.

Benefits of this training include the ability to:

- Recognize common types of bearings and identify basic terms, components, configurations and lubrication systems
- Perform regular preventive maintenance on different types of bearings
- Analyze bearing failures and better determine the causes for particular failures
- Use the knowledge gained to maintain and repair bearings
- Recognize the installation, design and application of different types of bearings

Electrical Print Reading

MP-10021

Duration: 4 or 8 hours

A valuable course for anyone who works with electrical equipment, *Electrical Print Reading* provides a basic understanding of how to read electrical prints. Special attention is devoted to ANSI guidelines for schematic symbols. To provide the most value, participants are encouraged to bring in actual plant schematics for use in the class. Depending on participant experience level and facility scheduling needs, the course can be conducted as a 4- or 8-hour session.

Benefits of this training include the ability to:

- Decipher electrical prints
- Understand commonly used ANSI symbols

Fall Protection

MP-10015

Duration: 4 or 8 hours

Falls are a major concern when working anywhere above the ground. They are the third leading cause of work-related fatalities, and 85% of all falls that occur on the job result in lost time. By having a sound knowledge of fall protection practices, falls and subsequent injuries can be prevented. This course will cover the concepts associated with the procedures, precautions and protective equipment necessary to create a safe work environment.

Benefits of this training include the ability to:

- Discuss the risks associated with working above ground and how to minimize those risks
- Demonstrate the proper care and inspection of equipment
- Demonstrate when and how to use guard rails, safety nets and personal fall arrest systems
- Utilize good housekeeping habits to avoid issues with dropped tools and other hazards
- Describe the difference between vertical and horizontal lifelines, and when to use them

Fluid Power Fundamentals

MP-10001

Duration: 24 hours

Need a general fluid power overview? This course is for you. It covers basic hydraulic and pneumatic systems, including theory, component operation and fluid power circuits. This course is well-suited to any professional involved in the basic maintenance and repair of hydraulic and pneumatic equipment.

Benefits of this training include the ability to:

- Describe fluid power and the components used in the design of pneumatic and hydraulic systems
- Perform regular preventive maintenance on hydraulic and pneumatic equipment and systems
- Respond quickly to equipment and system failures
- Use the knowledge gained to maintain and repair hydraulic and pneumatic equipment and controls

HVAC Air Conditioning & Refrigeration Fundamentals

MP-10022

Duration: 8 hours

A technician-level course developed for both operating and maintenance personnel, this course covers the basic mechanical refrigeration cycle, types of refrigerants, major refrigeration system components, and the fundamentals of system operation, maintenance and troubleshooting. We cover principles of small simple air conditioning systems, as well as large commercial systems. Hands-on training is accomplished with small air conditioning systems and computer simulations.

Benefits of this training include the ability to:

- Discuss the basic refrigeration cycle
- Describe application of this cycle to modern refrigeration units
- List types of refrigerants used in plants
- Describe troubleshooting techniques and where to go for help if needed
- Describe basic control systems and functions of control system components
- Discuss lubrication of system components, including properties and specifications of refrigerant oils
- Discuss charging and evacuation of refrigerants
- Discuss EPA requirements concerning refrigerants and their usage and storage
- Describe leak detection and repair

In addition to this class, a one-day Air Conditioning Refrigerant Regulation certification program is available, which must be preceded by the HVAC Fundamentals course. Ask your Applied® representative for details.



Hydraulic Troubleshooting

MP-10009

Duration: 8 hours

An excellent stand-alone course or follow-up to other fluid power sessions, this course focuses on hydraulic system operations, the sources and progression of contamination and various troubleshooting techniques. It is ideal for any personnel involved in the troubleshooting and repair of hydraulic equipment.



Benefits of this training include the ability to:

- Minimize failures in hydraulic equipment, thus reducing downtime and cost
- Perform regular preventive maintenance on hydraulic equipment and systems
- Quickly respond to equipment and system failures
- Gain an increased knowledge of hydraulic equipment and controls

Lockout Tagout

MP-10019

Duration: 4 or 8 hours

This customized, on-site course provides an overview of the specific lockout/tagout programs used in your facility. We discuss the requirements for lockout using OSHA standards, as well as plant-specific policies. This course is intended for all plant personnel required to utilize a lockout/tagout system.

Benefits of this training include the ability to:

- Describe the energy isolation requirements to safely work on equipment
- Describe the local lockout/tagout program and your requirements in using this system
- Demonstrate proper use of various lockout/tagout devices

Lubrication Technology

MP-10006

Duration: 16 hours

Almost any maintenance professional would benefit from this overview of lubrication systems. Course topics include the basics of lubrication, lubricants, filtration, maintenance, failure analysis and system design.

Benefits of this training include the ability to:

- Understand lubrication specifications, lubrication systems and applications, PLC lube controllers and mechanical timers
- Maintain system components, including pumps, filters, valves, reservoirs and manifolds, as well as different types of seals and their compatibility with different fluids
- Respond quickly to equipment and system failures
- Use the knowledge gained to maintain, repair and test lubrication systems and equipment

Motors & Drives Fundamentals

MP-10010

Duration: 16 hours

Motors and Drives Fundamentals covers AC and DC motor theory, including single- and three-phase induction motors, DC motors, synchronous motors, magnetic motor starters, controller fundamentals, reduced voltage starters, DC controllers and variable frequency drives. The course is recommended for maintenance and mechanically oriented personnel who interact with motors, motor controls and associated equipment.

Benefits of this training include the ability to:

- Minimize motor and drive failures in equipment, thus reducing downtime and cost
- Perform regular preventive maintenance on motors, motor controllers and drives
- Quickly respond to motor and drive failures
- Gain an increased knowledge of AC motors and DC motors and drives

Power Transmission Technology

MP-10008

Duration: 24 hours

A comprehensive review of power transmission systems, this course reviews types, maintenance, installation, repair and basic troubleshooting. Also included is a thorough review of chains, belts, couplings, gears and bearings. This course is useful to any maintenance professional who works with PT systems and components.

Benefits of this training include the ability to:

- Minimize failures in manufacturing equipment, thus reducing downtime and cost
- Perform regular preventive maintenance on power transmission components
- Respond quickly to equipment and system failures
- Use the knowledge gained to maintain and repair power transmission components, equipment and systems

Pumps & Seals

MP-10018

Duration: 8 hours

This course covers the basic theory and operation of the most common types of pumps and seals, including centrifugal pumps, positive-displacement pumps, mechanical seals and shaft sealing devices. It is ideal for skilled trades workers whose responsibilities involve pumps and seals. Participants will learn the basic concepts involved in the maintenance and troubleshooting of pumps and seals, including wear, overhaul, packing and alignment.

Benefits of this training include the ability to:

- Explain the basic concept and types of commonly used pumps
- Identify the parts of a pump and their function
- Identify the factors that affect pump performance
- Explain the purpose of packing
- Describe the purpose and operation of commonly used seals
- State the basic processes to troubleshoot pumps and seals

Rigging

MP-10013

Duration: 8 hours

An ideal course for rigging operators, suppliers and planners, *Rigging* covers the fundamentals of rigging operations and safety. We detail rigging gear, including wire rope, slings, rigging hardware, hoists, beams, trolleys, jacks, winches and cribbing. In addition, we cover rigging safety practices and precautions, how to plan a rigging job, selecting the right equipment, and moving and manipulating a load.



Benefits of this training include the ability to:

- Describe the most commonly used rigging gear
- Demonstrate the proper safety practices for rigging jobs
- Plan a rigging operation from start to finish
- Troubleshoot rigging problems
- Move or manipulate a load as needed

Root Cause Failure Analysis (RCFA)

MP-10023

Duration: 4 or 8 hours

Root Cause Failure Analysis (RCFA) is a technique used to determine the cause of undesirable events and prevent future occurrences. Undesirable events can include equipment failures, emergency incidents, technician errors, unsafe conditions, etc. This course describes how and when to use the RCFA technique. Students may perform practice exercises, depending on course length, to illustrate the various techniques in real-world situations. The course is designed for management, engineers, and senior operations and maintenance personnel who are responsible for diagnosing and correcting operational problems.

Benefits of this training include the ability to:

- Explain the Root Cause Failure Analysis technique
- Determine how to define a problem and gather pertinent information about it
- Utilize problem-solving techniques, such as Barrier Analysis, Change Analysis, and Effect and Causal Factor Analysis
- Evaluate and document problems and chosen solutions



Technical Troubleshooting

MP-10017

Duration: 8 hours

Technical Troubleshooting provides personnel with the opportunity to learn and apply proven troubleshooting strategies and methodologies. We explore a seven-step troubleshooting method and detail the process of troubleshooting. These exercises can be developed to be site-specific using equipment actually installed and maintained at your facility. Strategies can be used to manage problems ranging from relatively simple to progressively more difficult. Includes a reusable template and flowchart.

Benefits of this training include the ability to:

- Use troubleshooting skills to reduce plant-operating costs by minimizing equipment and system downtime and improve equipment reliability

The Graying Workforce – Who Will Keep Your Plant Running?

Training the Next Generation of Maintenance Professionals

U.S. manufacturing industries face a two-pronged attack on their very existence. First, the oldest of the Baby Boomers will reach age 65 in 2011, beginning a wave of retirements that will continue for the next 19 years. Second, younger people entering the workforce show less interest in the skilled trades as a vocation.



Most businesses are not prepared to face the prospect of being unable to find the skilled maintenance and reliable technicians they need to keep production equipment running. However, maintenance and repair professionals know that job training is an essential ingredient of equipment reliability. A study funded by the U.S. Department of Education with the Census Bureau found that training is one of the most effective ways to improve productivity.

Companies that successfully recruit and retain qualified replacements for retiring workers will have a significant competitive advantage in the marketplace. Training will form the backbone of that effort, and now is the time to establish a program to ensure that a competent workforce will be available to keep equipment operating reliably into the future.

Prepare for the future. Include MaintenancePRO® courses in your training program.

MaintenancePRO® Course Numbers

NOTE: Numbers shown are for 15 participants (or less). For 16-20, replace the number 15 in the number.

Course Number	Class
MP10003OSX15-2	Advanced Industrial Hydraulics, 2-Day On-Site Class, 1-15 Seats
MP10005OSX15-2	Advanced Industrial Pneumatics, 2-Day On-Site Class, 1-15 Seats
MP10014-11OSX15-1	Arc Flash Electrical Safe Work Practices (ESWP), 1-Day On-Site Class, 1-15 Seats
MP10020-11OSX15-1	Basic Electricity for Mechanics, 1-Day On-Site Class, 1-15 Seats
MP10002OSX15-1	Basic Industrial Hydraulics, 1-Day On-Site Class, 1-15 Seats
MP10004OSX15-1	Basic Industrial Pneumatics, 1-Day On-Site Class, 1-15 Seats
MP10007OSX15-2	Bearing Maintenance and Fundamentals, 2-Day On-Site Class, 1-15 Seats
MP10021-11OSX15-1	Electrical Print Reading, 1-Day On-Site Class, 1-15 Seats
MP10015-11OSX15-1	Fall Protection, 1-Day On-Site Class, 1-15 Seats
MP10001OSX15-3	Fluid Power Fundamentals, 3-Day On-Site Class, 1-15 Seats
MP10022-11OSX15-1	HVAC Air Conditioning & Refrigeration Fundamentals, 1-Day On-Site Class, 1-15 Seats
MP10009OSX15-1	Hydraulic Troubleshooting, 1-Day On-Site Class, 1-15 Seats
MP10019-11OSX15-1	Lockout Tagout, 1-Day On-Site Class, 1-15 Seats
MP10006OSX15-2	Lubrication Technology, 2-Day On-Site Class, 1-15 Seats
MP10010OSX15-2	Motors & Drives Fundamentals, 2-Day On-Site Class, 1-15 Seats
MP10008OSX15-3	Power Transmission Technology, 3-Day On-Site Class, 1-15 Seats
MP10018-11OSX15-1	Pumps & Seals, 1-Day On-Site Class, 1-15 Seats
MP10013-11OSX15-1	Rigging, 1-Day On-Site Class, 1-15 Seats
MP10023-11OSX15-1	Root Cause Failure Analysis (RCFA), 1-Day On-Site Class, 1-15 Seats
MP10017-11OSX15-1	Technical Troubleshooting, 1-Day On-Site Class, 1-15 Seats
CUSTOM OSX15-1	Custom On-site Class, 1-Day On-Site Class, 1-15 Seats
CUSTOM OSX15-2	Custom On-site Class, 2-Day On-Site Class, 1-15 Seats
CUSTOM OSX15-3	Custom On-site Class, 3-Day On-Site Class, 1-15 Seats

MaintenancePRO® is brought to you by Applied Industrial Technologies, North America's leading industrial distributor. Applied® is best known for expertise in power transmission, fluid power and overall MRO solutions. Now, Applied is bringing their expertise to you through the MaintenancePRO® program.

For more information, visit www.Applied.com/maintenancepro.



Contact Your Local Applied® Service Center
1-877-279-2799

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