An interactive guide to all resources available for Training

e-RESOURCE
TRAINING GUIDE
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Welcome to the United Association (UA) e-Resource Training Guide. Here you will find a one-stop resource for all of the e-Learning tools that are available to you for your use in the classroom, at home, or on the road, and to assign as homework for apprentices and journeymen. The purpose of the UA e-Resource Training Guide is to provide UA training centers with blended learning materials that accompany and or complement UA textbooks, Blackboard™ courses and JATC programs.

The United Association’s training system consists of numerous components, one of which is the UA Online Learning Resources online portal to your e-Learning resources. Here you will find our online Instructor Resource Library (IRL), Student Resource Library (SRL) and gateway to Washtenaw Community College's Blackboard™ system.

By visiting www.uaolr.org you will find IRL subjects that complement current UA textbooks by providing instructors with:

- Instructional Guides
- PowerPoint® Presentations
- Interactive Illustrations
- Exams
- Answer Keys
- Quick Quizzes®
- Illustrated Glossaries
- Flash Cards
- Course Outlines
- Worksheets
- Media Resources
- Student Resource Libraries

The Student Resource Library is a digital resource available to students online. To access the Student Resource Library, students need to be enrolled by their local union training center. Here students will find a pared-down version of the IRL for studying, taking Quick Quizzes®, viewing Flash Cards and access to Videos and the new UAwebBooks™ if available for the selected title.

Next you will find the UA’s Blackboard™ courses. The UA’s Blackboard™ courses are an additional resource designed to complement UA textbooks and assist in the training of apprentices and journeymen. Certain Blackboard™ courses serve as a platform for virtual reality simulations in crane signaling, HVACR, and plumbing service work, with plans to expand into other subject matters.

Finally, this guide will cover two applications developed for the membership. The apps can be used via a smart phone or a tablet. The first is the UA Training App. Here you can access UA training news, videos, regional training schedule, and recruitment materials. The second app is meant to supplement UA textbooks with an augmented reality component.

Take a few moments to browse the e-Resource Training Guide, learn more about what is available to you, and how to access these resources.
UA Online Learning Resources (UAOLR)
The United Association's training system consists of the Great Lakes Training Center, which is located in Ann Arbor, Michigan, and over 300 local union training centers across the United States and Canada.

The UA Training system provides common curricula for all five of the trades in the piping industry. Our system was designed to support and enhance training by sharing resources. These resources consist of various methods to train instructors by utilizing distance education, such as webinars, regional training courses at onsite locations, and internet-based classes using the Blackboard™ LMS and the UAOLR.

The UA Online Systems allow access for local union training centers to offer specialized courses, enabling instructors to provide training on specialized equipment.

UAOLR also provides a portal where our instructors can access and download e-Learning resources through our Instructor Resources Library (IRL). The IRL provides UA instructors with instructor's guides to the UA's textbooks, PowerPoint® presentations, exams, quizzes and multi-media training materials. UA Online Learning Resource site, offers a portal for UA students too — the Student Resources Library (SRL). Here a student can study and take quick quizzes, and sample exams to bring their skills up prior to taking an exam at their school. The SRL also allows students to access illustrated glossaries, flash cards, media and documents, with selected titles available in Spanish. This content can be displayed in either English or Spanish and an audio pronunciation of each term can be played to reinforce comprehension.

We are proud of the resources and tools we are able to provide UA instructors and apprentices through UA Online Learning Resources. Whether in a brick and mortar school or via distance education, UA is leading the way in training the piping industry professionals today.

How do I get started?

The training director/coordinator must approve access to UA Online Learning Resources. All users, instructors, apprentices and students need to have a username and password to access the system.

The local union training center must have at least one designated local administrator to upload and manage their apprentices and students (Local Dashboard Access.) If you do not have access, contact your local training center.

Business managers, please have your training director/coordinator contact Lauren Friedman by email at: lfriedman@uanet.org if you have any questions.
Instructor Resource Library (IRL)

- Descriptions
- Material Available
The Instructor Resource Library (IRL) is a portal where instructors can access and download e-Learning resources. Below are the course materials, descriptions and resources that are available to complement a textbook or are a stand alone course.

2nd Year Apprentice—Understanding the Full Cost of an Hour of Labor

This resource is vital in providing detailed explanations to apprentices of the full cost to the employer in putting a UA employee to work. It’s intended to benefit 2nd year or new UA Apprentices.

The resources provided in the 2nd Year Apprentice—Understanding the Full Cost of an Hour of Labor Instructor’s Resource Library are:

- Instructor’s Lesson Plan
- Student Workbook
- PowerPoint® Presentations
- UA Curriculum Material
- Quick Quiz®

A video explaining all labor costs, such as insurance, taxes, fees, fuel, etc. is located in the Media tab.

5th Year Apprentice—Understanding the Full Cost of an Hour of Labor

This resource includes all items from the 2nd Year Apprentice—Understanding the Full Cost of an Hour of Labor resource, but with additional Bid Exercise Materials such as spreadsheet example bid calculations, plans, and items taken from the Foreman Training Course providing workshop documents for a fictional job bid. This resource is meant for 5th year apprentices, and helps provide a thorough understanding of Labor costs.

The resources provided in the 5th Year Apprentice—Understanding the Full Cost of an Hour of Labor Instructor’s Resource Library are:

- Instructor’s Lesson Plan
- Student Workbook
- PowerPoint® Presentations
- UA Curriculum Material
- Quick Quiz®

Applied Science of Instrumentation

The Instrumentation resource has been designed to provide a foundation of knowledge for the prospective instrumentation technician. Topics covered include fundamentals of process and control systems; instrumentation symbols and diagrams; principles of pressure, level, flow, and temperature; control valves, actuators, and accessories; installation of control systems; process control loop checking, start-up and tuning, and troubleshooting; and distributed control systems.

The resources provided in the Applied Science of Instrumentation Instructor’s Resource Library are:

- Instructor's Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments / Student Resource Library (SRL) Access
- Online Resources
Backflow Prevention Reference Manual

This resource is designed to teach the basics of backflow prevention and cross-connection control. The user will be able to identify and test the wide variety of backflow preventers, and recognize the devices that cannot be tested. The tester will be able to identify backflow preventers that have failed and properly report those failures.

In its entirety, this resource will supply the information necessary to certify individuals as backflow prevention testers, certified repair technicians, and certified backflow prevention surveyors. Once you have completed training, you should be a competent member of this vital field of UA tradesmen, water suppliers, and engineers dedicated to “protecting the health of the nation.”

The resources provided in Backflow Prevention Reference Manual Instructor’s Resource Library are:

- Instructional Outlines
- Illustrated Glossary
- PowerPoint® Presentations
- Flash Cards
- Interactive Illustrations
- Forms and Documents
- Exams
- Media
- Answer Keys
- Updates / Comments
- UA Curriculum Material
- Online Resources

Basic Electricity

This instructional guide describes the value and intended use of each component of the Basic Electricity theory training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the manual.

The resources provided in Basic Electricity Instructor’s Resource Library are:

- Instructor’s Guide
- Quick Quizzes®
- Instructional Outlines
- Illustrated Glossary
- PowerPoint® Presentations
- Flash Cards
- Interactive Illustrations
- Forms and Documents
- Assignments
- Media
- Assessments
- Updates / Comments
- Answer Keys
- Online Resources
- UA Curriculum Material

Building Controls

The Building Controls resource is a comprehensive guide to the operation of modern building control systems. The topics covered include an introduction to building control systems, control concepts, network data communications, and electrical system control devices and applications. Also covered are HVACR system energy sources, HVACR system control devices and applications, plumbing system control devices and applications, automated building operation, system integration, and trends in building automation.

The resources provided in the Building Controls Instructor’s Resource Library are:

- Instructor’s Guide
- Quick Quizzes®
- Premium PowerPoint® Presentations
- Illustrated Glossary
- Interactive Illustrations
- Flash Cards
- Assessments
- Media
- Answer Keys
- Updates / Comments
- Building Controls UAwebBook
- Online Resources
Drainage Systems

The Drainage Systems resource covers content related to the sanitary disposal of wastes, the efficient disposal of storm water, the use of proper wastewater disposal systems, and alternative water sources. Topics include an introduction to drainage, drainage system piping materials and supports, traps and fixture connections, sanitary drainage piping installation, vent systems, DWV sizing, storm drainage, sewers and sewage treatment, private sewage disposal systems, and alternate water source drainage systems.

The resources provided in the Drainage Systems Instructor's Resource Library are:

- Instructor's Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

E-Instruction Training

The e-Instruction IRL is made up of three separate instructional components to help you set up and operate a Mobi or CPS and ExamView software too.

**Mobi:** The e-Instruction Mobi is best described as a wireless mouse that is also a Portable Interactive Whiteboard. The Mobi allows you to control your computer from anywhere in the classroom. It is operated wirelessly by an RF (Radio Frequency) Receiver plugged into a USB port of your computer. The receiver has a distance range of well over 50'. Whatever you can do sitting at your computer with your mouse you now will be able to do with the Mobi. You are no longer tied to the computer or to the front of the room. You can control anything on your computer wirelessly from any location in the classroom. When the Mobi is used with a projector, the picture image of your computer screen is projected. The Mobi works great on a white wall, a marker board or even another whiteboard.

**ExamView:** Streamline assessment from start to finish with ExamView Assessment Suite, a complete toolset in three seamless applications. Build comprehensive tests with Test Generator, administer tests with Test Player, and analyze results with Test Manager.

**CPS:** (Classroom Performance System) is software that leverages the use of student handheld devices (clickers) to garner feedback, boost engagement and interaction, and increase teacher effectiveness. CPS is used by millions of students and teachers in more than 500,000 classrooms. Keep students engaged and involved in class. Facilitate greater student-teacher interaction in a fun, dynamic learning environment that encourages class discussion and participation. Students who normally remain silent in class now answer every question with confidence.

Energy Auditing Practices

Where energy used to be treated as a limitless, cheap commodity, efforts now are concentrated on conservation, cost, efficiency, and environmental responsibility. Innovation in equipment and system controls has allowed us to improve efficiency without sacrificing comfort, health, or safety. These strategies, however, rely on skilled and knowledgeable technicians who must identify opportunities for increased efficiency and implement the most cost-effective retrofits. The Energy Auditing Practices manual will help train UA personnel in the entire energy auditing process.

The resources provided in the Energy Auditing Practices Instructor's Resource Library are:

- Instructor's Guide
- PowerPoint® Presentations
- Interactive Illustrations
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Energy Auditing Practices UAw ebBook
- Flash Cards
- Audit Forms
- Media
- Updates / Comments
- Online Resources
Foreman Training Manual

The Foreman Training Manual will serve potential foremen by instilling the principles of the UA Standard for Excellence, enabling him or her to effectively convey these principles on each and every job site. It takes the user through a realistic realm of the daily duties of a foreman, including chapters titled “Planning and Scheduling,” “Documentation and Record-Keeping,” “Managing, Measuring, and Improving Productivity,” “Change Orders,” and “Close-out.” It encompasses the behavioral mindsets of individuals on the job, and how to properly deal with each issue that may arise, inclusive in chapters titled “Image and Professionalism,” “Relationships,” and “Understanding and Resolving Conflict and the Art of Negotiation.” Each student will walk away with a complete knowledge of what is expected of a certified UA foreman.

The resources provided in the Foreman Training Manual Instructor’s Resource Library are:
- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Exercises
- Exercises Answer Keys
- Interactive Illustrations
- Quick Quizzes®
- Media
- UA Curriculum Material
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Updates / Comments
- Online Resources

GPRO-Fundamentals of Building Green

This instructional guide describes the value and intended use of each component of the GPRO Fundamentals of Building Green training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the textbook.

The resources provided in the GPRO-Fundamentals of Building Green Instructor’s Resource Library are:
- Instructor’s Guide
- Instructional Plans
- PowerPoint® Presentations
- Interactive Illustrations
- Exams
- Answer Keys
- Forms and Documents
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Updates / Comments
- Online Resources

GPRO-Green Mechanical Systems

This instructional guide describes the value and intended use of each component of the GPRO Green Mechanical Systems training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the textbook.

The resources provided in the GPRO-Green Mechanical Systems Instructor’s Resource Library are:
- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- Forms and Documents
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Media
- Updates / Comments
- Online Resources
**GPRO-Green Plumbing Systems**

This instructional guide describes the value and intended use of each component of the GPRO Green Plumbing Systems training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the textbook.

The resources provided in the *GPRO-Green Plumbing Systems* Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Plans
- Powerpoint® Presentations
- Interactive Illustrations
- Exams
- Answer Keys
- UA Curriculum Material
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources
- Quick Quizzes®

**HVAC and Refrigeration Systems**

This training manual covers all aspects of residential and light commercial heating, ventilation, and air conditioning systems, focusing specifically on the operation, installation, service maintenance, and troubleshooting of these systems. The textbook covers heating and refrigeration fundamentals, psychrometrics, building mechanical systems, and electrical and electronic devices and controls. The textbook covers air-and water-source heat pump and chiller systems and includes 100 installation and 65 step-by-step service procedures. Energy efficiency practices, energy auditing, building commissioning, and retrofitting are covered as part of Energy Star and LEED certifications.

The resources provided in the *HVAC and Refrigeration Systems* Instructor’s Resource Library are:

- Instructor’s Guide
- Powerpoint® Presentations
- Interactive Illustrations
- Exams
- Answer Keys
- UA Curriculum Material
- HVAC and Refrigeration Systems UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Interactive Animations
- Library
- Step-by-Step Procedures
- Review Questions
- Media
- Updates / Comments
- Online Resources

**Hydronic Heating and Cooling**

This instructional guide describes the value and intended use of each component of the Hydronic Heating and Cooling training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the textbook.

The resources provided in the *Hydronic Heating and Cooling* Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- Powerpoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- UA Curriculum Material
- Hydronic Heating and Cooling UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Forms and Documents
- Media
- Updates / Comments
- Online Resources
Medical Gas Certification

The resources provided in the Medical Gas Certification Instructor's Resource Library highlight the code concepts required by medical gas system installers and are designed to serve as a basis for instruction. Like an artisan using specialized tools, an instructor uses many instructional tools, including personal experience, to further supplement this material.

The resources provided in the Medical Gas Certification Instructor's Resource Library are:

- Instructor's Guide
- Instructional Outline
- Course Outline
- PowerPoint® Presentations
- Interactive Illustrations
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Form and Documents (Instructor Version)
- Forms and Documents
- Worksheets
- Worksheet Answer Keys
- Media
- Updates / Comments
- Online Resources

Other UA Book Resources (Contains 8 titles)

Advanced Plan Reading and Related Drawings – The Advanced Plan Reading manual covers advanced plan reading, working sketches, the development of sleeve and coordinated drawings and an introduction to computer-aided drafting. A set of specifications and building plans (44 drawings) in addition to special drawing sheets are included with the manual.

The resources provided in the Advanced Plan Reading and Related Drawings Instructor’s Resource Library are:

- Instructor's Guide
- Assessments
- Assignments and Answers
- Review Exams and Answers

Advanced Valve Repair – The Advanced Valve Repair manual goes beyond the basics. It covers mindset procedures and emphasizes the importance of precision measuring instruments. It covers error-free maintenance and also narrates and illustrates the repair and disassembly of a pressure seal ring valve. The manual illustrates how to assemble and disassemble a control valve and how to disassemble and replace damaged parts in a valve actuator. Illustrations of various actuators and control valves with diagrams and charts are included to aid in identifying the appropriate parts.

The resources provided in the Advanced Valve Repair Instructor’s Resource Library are:

- Equipment Analysis
- Figures
- Review Exams and Answers

Drawing Interpretation – The Drawing Interpretation and Plan Reading manual contains seven chapters that cover an introduction to basic drawing tools, measuring tools and lettering skills; three-view, plan view and elevation view drawings; graphic symbols for pipe fittings and valves; interpretation of technical diagrams; piping drawings; interpretation of building plans and building specifications. The manual also comes with a complete set of building plans with specifications and ruled isometric and blocked paper.

The resources provided in the Drawing Interpretation Instructor’s Resource Library are:

- Assessments
- Assignments and Answers
- Exercise and Answers
- Review Exams and Answers
- Figures
**Pumps** – The Pumps manual describes the operating principles of many of the pumps currently in use in the piping industry. Even though there are many different manufacturers of this equipment and many different sizes and capacities within each type of pump, the principles contained in the manual can be applied to almost any type or make of pump encountered. The manual covers pump theory, types of pumps, pump installation, pump systems, and troubleshooting.

The resources provided in the **Pumps** Instructor’s Resource Library are:

- Assessments
- Assignments and Answers
- Review Exams and Answers

**Refrigeration** – The Refrigeration manual was developed to train service journeyworkers in all aspects of refrigeration. A step-by-step procedure is followed from the basic cycle through centrifugal and absorption systems, the related equipment, controls, start-up, testing and repair of various types of refrigeration equipment.

The resources provided in the **Refrigeration** Instructor’s Resource Library are:

- Assessments
- Assignments and Answers

**Related Science** – The Related Science manual covers topics including the properties of water, the laws of hydraulics and pneumatics as they are related to piping systems, and how the basic principles of mechanics apply to the tools of the pipe trades. Additional topics covered include the metals used in the piping industry and corrosion and how it affects piping materials.

The resources provided in the **Related Science** Instructor’s Resource Library are:

- Assessments
- Assignments and Answers
- Classroom Experiments
- Review Exams and Answers

**Start, Test and Balance** – This manual is designed to impart the general knowledge and theory needed to properly use testing and measuring instruments. It also presents the proper procedures for performing the testing, balancing, and adjusting. The principles of fluid flow and heat transfer as related to air and water balancing are covered and the application and operation of system components such as fans and pumps are detailed. Electrical measurements and motor efficiency and performance calculations also are covered.

The resources provided in the **Start, Test and Balance** Instructor’s Resource Library are:

- Assessments
- Assignments and Answers

**Valve Repair** – Valves are so commonplace and so widely used in industry that often little attention is paid to them until they fail to perform as required. The Valve Repair Program manual features topics including error-free maintenance, precision measuring instruments, fasteners and torquing, valve packing, and various types of valves.

The resources provided in the **Valve Repair** Instructor’s Resource Library are:

- Assessments
- Assignments and Answers
- Figures
Plumbing Service, Maintenance, and Repair

The installation of plumbing systems in new construction is performed by pipe trades journeymen and apprentices. Once these new piping systems and fixtures are installed, they must be maintained and serviced. Maintenance and service represent a high percentage of the total work performed in the plumbing industry. The Plumbing Service, Maintenance, and Repair manual covers 11 major plumbing topics and includes service and repair troubleshooting tables and internet resources.

The resources provided in the Plumbing Service, Maintenance, and Repair Instructor’s Resource Library are:

- Instructor’s Guide
- PowerPoint® Presentations
- Interactive Illustrations
- Chapter Exams
- Chapter Exam Answer Keys
- UA Curriculum Material
- Plumbing Service, Maintenance, and Repair UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

Rigging

The Rigging resource provides an instructional platform to aid in the teaching of this essential skill. From differentiating between types of rope, to determining load weights, rigging instructors can use these tools to create more effective lesson plans and help their students succeed.

The resources provided in the Rigging Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Exams
- Assignments
- Answer Keys
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

Solar Water Heating Systems: Fundamentals and Installation

This resource is a comprehensive guide to the installation of residential and light commercial domestic hot water and swimming pool solar water heating systems. The topics covered include solar thermal principles, system operation fundamentals, system design and sizing, site assessment, system startup and maintenance, system installation safety, and installation and service of system components, such as collectors, storage tanks, and operational control systems.

The resources provided in the Solar Water Heating Systems: Fundamentals and Installation Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- UA Curriculum Material
- Solar Radiation Data Sheets
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Solar Radiation Data Sets
- Sun Path Charts
- Media
- Updates / Comments
- Online Resources
Soldering & Brazing

This instructional guide describes the value and intended use of each component of the Soldering & Brazing training package. This guide also provides information about key elements that determine instructional program format, the instructional methods used by successful instructors, and detailed instructional plans that correspond to each chapter of the manual.

The resources provided in the Soldering & Brazing Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assignments
- Assessments
- Answer Keys
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

Sprinkler Fitter - Fire Protection Technology

The installation of fire protection technologies in new and existing buildings are performed by UA Sprinkler Fitters and Apprentices per NFPA 20 requirements. Once these life safety components are installed and commissioned, these systems must be inspected, tested, maintained and serviced on a periodic basis as per NFPA 25. Maintenance and service represent a high percentage of the total work performed in the sprinkler industry. The Sprinkler Fitter – Fire Protection Technology resource provides guides and guidance to successfully perform inspection, testing maintenance and repair on fire protection technologies and their components to ensure these systems are performing as designed.

The resources provided in the Sprinkler Fitter - Fire Protection Technology Instructor’s Resource Library are:

- Victaulic Vortex System and Installation
- Fundamentals Guide
- Fire Suppression Systems
- Media
- Course Evaluation

Sprinkler Fitter - Fire Pumps

The installation of fire pumps in new and existing buildings are performed by UA Sprinkler Fitters and Apprentices per NFPA 20 requirements. Once these life safety components are installed and commissioned, these systems must be inspected, tested, maintained and serviced on a periodic bases as per NFPA 25. Maintenance and service represent a high percentage of the total work performed in the sprinkler industry. The Sprinkler Fitter – Fire Pump resource provides methods and guides to successfully preform inspection, testing maintenance and repair on fire pumps and their components to ensure these systems are performing as designed. The code requirements per NFPA 20 and NFPA 25 for installation, inspection, testing and maintenance for fire pumps along with requirements for proper PPE per NFPA 70E are addressed within this training recourse.

The resources provided in the Sprinkler Fitter Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Worksheets
- Answer Keys
- UA Curriculum Material
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

STAR Study Guides

This resource is where you will find the study guides for the UA STAR certification exams.

The study guides are found in the Forms and Documentation tab. The resources are:

- UA STAR HVACR Commercial Refrigeration Study Guide
- UA STAR HVACR Residential/Light Commercial Study Guide
- UA STAR HVACR Study Guide 4-13-15
- UA STAR Pipefitter Study Guide
- UA STAR Plumbers Study Guide
- UA STAR Sprinkler Fitter Study Guide
Steam Systems
The Steam Systems resource contains instructional and multi-media content on scientific principles pertaining to the properties and characteristics of water and steam, hydraulics and pneumatics, mechanics, metals, alloys, synthetics, and corrosion. Other main topics include: steam systems, steam heating principles, low-pressure boilers, steam piping systems, heat transfer units, steam traps, gravity condensate return, one and two pipe systems, two pipe mechanical return steam heating systems, vapor, vacuum and variable vacuum steam heating systems, high-pressure boilers, steam generation plants, and steam system operation and maintenance in all types of buildings – residential, commercial, institutional, and industrial.

The resources provided in the Steam Systems Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- Assessments Answer Keys
- UA Curriculum Material
- Steam Systems UAwebBook
- UAAdaptive Quizzes
- Illustrated Glossary
- Flash Cards
- Media
- Updates / Comments
- Online Resources

Technologies for the Pipe Trades
The Technologies IRL is designed to help orient apprentices with the tools of the trades and educate them on the proper and appropriate use. From administrative software like Autodesk and TSheets to trade-specific apps and tools, the industry is changing, and helping out apprentices remain abreast of the latest tools and tricks will help them get ahead in their careers.

The resources provided in the Technologies for the Pipe Trades Instructor’s Resource Library are:

- Administrative Technology News Resources
- BIM (Building Information Modeling) HVAC\R
- Document Control Pipefitter
- First Aid and Safety Plumber
- Hardware and Software Sprinklerfitter
- Math and Formulas Welder
- Project Management Questions and Comments
- Tool and Equipment

Use and Care of Tools
The pipe trades industry continues to go through rapid changes in installation technologies and material development in all phases of the trade, including the residential, commercial, industrial, maintenance, and service industries. The type of materials used and the kinds of tools required for the installation of complex piping systems and equipment continue to evolve; however, many basic fundamentals still exist and apply to the industry today. This illustrated manual covers seven major manual and power tool topics, including safe use of tools, ladders and scaffold use, measuring and layout tools, hand tools, power tools, piping system joining tools, and specialty tools.

The resources provided in the Use and Care of Tools Instructor’s Resource Library are:

- Instructor’s Guide Quick Quizzes®
- Instructional Outlines Illustrated Glossary (English/Spanish)
- PowerPoint® Presentations Flash Cards (English/Spanish)
- Interactive Illustrations Forms and Documents
- Exams Media
- Answer Keys Updates / Comments
- UA Curriculum Material Online Resources
- Use and Care of Tools UAwebBook
Water Supply Systems
The newly revised manual includes chapters on historical perspectives of water supply systems, water sources and treatment, water piping materials, water distribution systems, building water supply systems, sizing building water supply systems, water heating, and water conservation. Elements of these topics include fittings and supports, system design, thermal expansion, water heaters, and protection of the water supply and building occupants. Current water conservation technologies are included, such as alternative water sources, and water-saving fixtures, appliances, and methods.

The resources provided in the Water Supply Systems Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- Water Supply Systems UAwebBook
- UA Curriculum Material

Welding Practices and Procedures for the Pipe Trades
The Welding Practices and Procedures resource covers welding fundamentals and the proper processes, techniques, and procedures to become competent in the welding field. Topics include an introduction to welding, shielded metal arc welding (SMAW), gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), other welding and joining processes, weld evaluation and testing, and welding technology.

The resources provided in the Welding Practices and Procedures for the Pipe Trades Instructor’s Resource Library are:

- Instructor’s Guide
- Instructional Outlines
- PowerPoint® Presentations
- Interactive Illustrations
- Assessments
- Answer Keys
- UA Curriculum Material
Student Resource Library (SRL)

- Material Available
The Student Resource Library (SRL) is a portal where students can access and download e-Learning resources. Below are the course materials and resources that are available to complement each textbook.

Students need to have a username and password to access the Student Resource Library. Access needs to be provided by the student’s local training center “Dashboard” Administrator.

2nd Year Apprentice - Understanding the Full Cost of an Hour of Labor

- Student Workbook
- Quick Quizzes®
- Flash Cards
- Media
- Updates / Comments
- Online Resources

5th Year Apprentice - Understanding the Full Cost of an Hour of Labor

- Student Workbook
- Quick Quizzes®
- Flash Cards
- Bid Exercise Material
- Media
- Online Resources

Applied Science of Instrumentation

- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates/Comments/Student Resource Library (SRL) Access
- Online Resources

Backflow Prevention Reference Manual

- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Updates / Comments
- Online Resources

Basic Electricity

- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Media
- Online Resources
Building Controls
   Building Controls UAwebBook
   Quick Quizzes®
   Illustrated Glossary
   Flash Cards
   Media
   Updates / Comments
   Online Resources

Drainage Systems
   Quick Quizzes®
   Illustrated Glossary
   Flash Cards
   Media
   Online Resources

e-Instruction Training
   Mobi
   ExamView
   CPS

Energy Auditing Practices
   UA Curriculum Material
   Quick Quizzes®
   Illustrated Glossary
   Energy Auditing Practices UAwebBook
   Flash Cards
   Audit Forms
   Online Resources

Foreman Training Manual
   Exercises
   Exercises Answer Keys
   Quick Quizzes®
   Media
   Illustrated Glossary
   Flash Cards
   Online Resources

GPRO-Fundamentals of Building Green
   Quick Quizzes®
   Illustrated Glossary
   Flash Cards
   Online Resources

GPRO-Green Mechanical Systems
   Interactive Illustrations
   Quick Quizzes®
   Illustrated Glossary
   Flash Cards
   Media
   Online Resources
GPRO-Green Plumbing Systems
- Interactive Illustrations
- Exams
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Media
- Online Resources

HVAC and Refrigeration Systems
- HVAC and Refrigeration Systems UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Forms and Documents
- Interactive Animations
- Library
- Step-by-Step Procedures
- Review Questions
- Media
- Updates / Comments
- Online Resources

Hydronic Heating and Cooling
- UA Curriculum Material
- Hydronic Heating and Cooling UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Media
- Updates / Comments

Medical Gas Certification
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Online Resources

Plumbing Service, Maintenance, and Repair
- Plumbing Service, Maintenance, and Repair UAwebBook
- Quick Quizzes®
- Illustrated Glossary (English/Spanish)
- Flash Cards (English/Spanish)
- Media
- Online Resources

Rigging
- Quick Quizzes®
- Illustrated Glossary
- Flash Cards
- Forms and Documents
- Media
- Online Resources
Sodering & Brazing
Assignments
Quick Quizzes®
Illustrated Glossary
Flash Cards
Media
Online Resources

Solar Water Heating Systems: Fundamentals and Installation
Solar Water Heating Systems UAwebBook
Quick Quizzes®
Illustrated Glossary
Flash Cards
Solar Radiation Data Sheets
Sun Path Charts
Media
Online Resources

Sprinkler Fitter - Fire Protection Technology
Victaulic Vortex System and Installation Fundamentals Guide
Fire Suppression Systems
Media
Course Evaluation

Sprinkler Fitter - Fire Pumps
Worksheets
Quick Quizzes®
Illustrated Glossary
Flash Cards
Media
Updates / Comments
Online Resources

STAR Study Guides
Forms and Documents
Updates / Comments

Steam Systems
UA Curriculum Material
Steam Systems UAwebBook
UAdaptive Quizzes
Illustrated Glossary
Flash Cards
Media
Updates / Comments
Online Resources
Technologies for the Pipe Trades

Administrative
BIM (Building Information Modeling)
Document Control
First Aid and Safety
Hardware and Software
Math and Formulas
Project Management
Tool and Equipment
Technology News Resources
HVAC/R
Pipefitter
Plumber
Sprinklerfitter
Welder
Questions and Comments

Use and Care of Tools

Use and Care of Tools UAwebBook
Quick Quizzes®
Illustrated Glossary (English/Spanish)
Flash Cards (English/Spanish)
Forms and Documents
Media
Online Resources

Water Supply Systems

Water Supply Systems UAwebBook
UA Curriculum Material
Quick Quizzes®
Illustrated Glossary
Flash Cards
Forms and Documents
Media
Updates/Comments
Online Resources

Welding Practices and Procedures for the Pipe Trades

Quick Quizzes®
Illustrated Glossary
Flash Cards
Forms and Documents
Media
Updates / Comments
Online Resources
Blackboard™

- Blackboard™ Request Procedure
- Blackboard™ Support
- Computer Requirements
- Required Computer Skills
- Blackboard™ Template Course Site Descriptions
- Interactive Modules
Blackboard™ is the home of the WCC-UA Blackboard™ LMS (Learning Management System.) It is a secure site which requires a user name and password issued by Washtenaw Community College (WCC). This system is for online teaching of particular courses or it can also be used to supplement existing Apprenticeship Programs.

The Blackboard™ LMS is a web based interactive learning environment that supports learning and teaching in face to face, blended learning, and can be used as a supplemental resource for your local training classes too.

Instructors can post grades, information, assignments and interact with class participants by way of email, discussion board or Wikis. Students can get class materials, submit homework, and communicate with their instructors and classmates, all online.

UA Training Department has developed several “Blackboard™ Course Template Shells” for local unions to request and use as needed in their own local training programs.

There are three basic types of Blackboard™ Course Site Template Shells:

1. A fully populated Master Course site which is designed to be used with the UA textbook for the course topic. The site includes syllabus, chapter units, assignments and assessments. All content may be customized to meet the local’s requirements for teaching the subject. These courses may include content from the UA Online Learning Resource Library.

2. Resource Course includes reference material, training documents, PowerPoints, links and other information that pertains to a specific subject. These documents are shared by other UA instructors and stored in a shell where you will be added as a student and may download course content to supplement any courses you are currently teaching. Instructors will be added to these courses to access materials but will not be able to enroll students.

3. Course Sites hosting the Interactive Module for the specific topic. These include sites such as Crane Signaling, HVAC Troubleshooting, Industrial Rigging and others. These Blackboard™ course sites do not have any additional material. However, the local union instructor may customize the site to include content for training or reinforcing the particular module topic.

The UA provides the WCC Blackboard™ system at no additional cost to your local JATC as part of our partnership with Washtenaw Community College.

Blackboard™ Request Procedure
To request a Blackboard™ course you must have an UAnet account or an OLR (Online Learning Resource) account. The form can be found on the Home page of UANet.org under Quick Links and it can also be found on UAOLR.org Instructor Resource Library website in the navigation bar at the top of the page.
WCC/UA Blackboard™ Help Desk Support
UA Instructor Blackboard™ Live Support: 734-477-8908 or (734) 219-2831 8:00 am – 4:00 pm EST
24/7 Blackboard™ Support: 1-800-218-4341
Blackboard™ Online Student Help: https://en-us.help.blackboard.com/Learn/Student
Blackboard™ Online Instructor Help: https://en-us.help.blackboard.com/Learn/Instructor

Computer Requirements for Blackboard™ Online Training
To use Blackboard™, the UA recommends a Windows PC or equivalent Mac computer to take online or blended classes. It should have a high-speed internet connection, such as a DSL or cable connection. Other devices, such as a phone, tablet, or chromebook can be used, but you may experience limited functionality with some activities in Blackboard™.

Blackboard™ does offer an app for instructors and students, but it is not currently recommended by the UA. If you are using a phone or tablet, it is best to access Blackboard™ through your internet browser.

To access Blackboard™, you will need one of the following browsers:

• Chrome
• Firefox
• Microsoft Edge
• Safari

You will also need the following software:

• Adobe Acrobat Reader
• Microsoft Office or equivalent word processing software

For the most current list of computer hardware and software requirements for WCC/UA Blackboard™, including version numbers, go to: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support.

Computer Skills Required by Instructors
To provide a quality learning experience for both instructors and students, training centers requesting a course shell should have an experienced Blackboard™ instructor. Instructors looking to gain proficiency in Blackboard™ or expand their skills, can attend free online Blackboard™ teaching courses. These courses are taught by UA instructors online and can be found at our UA Members Only website. Training directors can sign-up their instructors by logging into UANet.org and clicking the following link for Regional Training Registration: Regional Training.

Please contact Cathy Merkel for additional assistance at cathym@uanet.org.

Computer Skills Required by Participants
To participate successfully in an online or blended class, you should be able to:

• Perform basic word processing.
• Use a web browser to visit websites and print web documents.
• Use email to send and receive messages, reply to messages, cut and paste text between messages, open attachments, and attach files to messages.
Blackboard™ Template Course Site Descriptions

The UA Training Department has developed the following Blackboard™ course template shells for local instructors to request and use as needed in their own local training programs. The shells contain instructional content that follows UA course manuals and complements the material in the Instructor Resource Library. The materials are completely customizable; instructors may choose to edit or delete course content or add some of their own.

Courses available for request:

Master course sites contain materials for an entire semester of course work, such as a syllabus, readings, and tests.

Resource course sites include a variety of training content for use to supplement any existing course related to the subject. Instructors will be added as students to these Blackboard™ course sites.

Interactive modules only include virtual activities for student and instructor. They do not contain formal tests or assignments; however, instructors may add their own materials after receiving a copy of the course.

UA Full Course Sites

Applied Science of Instrumentation

OVERVIEW: This Blackboard™ course is designed to provide a foundation of knowledge for the prospective instrumentation technician.

TOPICS COVERED: Fundamentals of process and control systems; instrumentation symbols and diagrams; principles of pressure, level, flow, and temperature; control valves, actuators, and accessories; installation of control systems; process control loop checking, start-up and tuning, and troubleshooting; and distributed control systems.

TEXTBOOK: Applied Science of Instrumentation

INSTRUCTOR RESOURCES:
- Circuit Builder Interactive Training Module
- Videos and other engaging interactive multimedia
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Backflow Prevention

OVERVIEW: This resource course is designed to teach the basics of backflow prevention and cross-connection control and will supply the information necessary to certify individuals as backflow prevention testers, certified repair technicians, and certified backflow prevention surveyors.

TOPICS COVERED: Definitions, testable and non-testable devices, codes, installation requirements, gauges, troubleshooting, and testing procedures.

TEXTBOOK: Backflow Prevention Reference Manual

INSTRUCTOR RESOURCES:
- Editable PowerPoints
- Quizzes and Tests
Basic Electricity Theory

OVERVIEW: This Blackboard™ course provides information on electrical theory, devices, circuits, and electric measuring instruments as they relate to the installation of mechanical equipment and piping systems.

TOPICS COVERED: Electrical safety, fundamentals of electricity and electric circuits, magnetism and electromagnetism, direct and alternating currents, circuits and transformers, inductance, and capacitance.

TEXTBOOK: *Basic Electricity Theory* (UAwebBook available)

INSTRUCTOR RESOURCES:
- Basic Electricity Trivia Game
- Circuit Builder Interactive Training Module
- Videos and other engaging interactive multimedia
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Building Controls

OVERVIEW: This Blackboard™ course covers all aspects of automation and efficiency in a building.

TOPICS COVERED: Introduction to building control systems, control concepts, network data communications, and electrical system control devices and applications. Also covered are HVACR system energy sources, HVACR system control devices and applications, plumbing system control devices and applications, automated building operation, system integration, and trends in building automation.

TEXTBOOK: *Building Controls* (UAwebBook available)

INSTRUCTOR RESOURCES:
- Circuit Builder Interactive Training Module
- Videos and other engaging interactive multimedia
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Drainage Systems

OVERVIEW: This Blackboard™ course content related to the sanitary disposal of wastes, the efficient disposal of storm water, the use of proper wastewater disposal systems, and alternative water sources.

TOPICS COVERED: Drainage, drainage system piping materials and supports, traps and fixture connections, sanitary drainage piping installation, vent systems, DWV sizing, storm drainage, sewers and sewage treatment, private sewage disposal systems, and alternate water source drainage systems.

TEXTBOOK: *Drainage Systems* (UAwebBook available)

INSTRUCTOR RESOURCES:
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives
Drawing Interpretation and Plan Reading

OVERVIEW: This Blackboard™ course content course is a must for learning the basic skills needed to interpret technical drawings and apply this knowledge on the job site.

TOPICS COVERED: Basic drawing, measuring tools, lettering skills, graphic symbols for pipe fittings, and valves, along with a complete set of building plans with specifications.

TEXTBOOK: Drawing Interpretation

INSTRUCTOR RESOURCES:
- Interactive curriculum including augmented reality
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Financial Literacy for Apprentices

OVERVIEW: This Blackboard™ course provides resources for learning the impact of loans, earning credit, savings, investments and retirement.

TOPICS COVERED: Basics of banking, goal setting, budgets, tracking spending, debt management, credit, and smart consumerism.

TEXTBOOK: N/A

INSTRUCTOR RESOURCES:
- Includes interactive Financial Literacy Game for apprentices
- Helpful links including government websites and financial calculators
- Videos and other engaging interactive multimedia
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Foreman Training

OVERVIEW: This Blackboard™ course prepares students for the UA/MCAA Foreman certification examination.

TOPICS COVERED: Leadership, relationships, documentation, work plans and schedules, safety, subcontractors and supplier coordination, and productivity management.

TEXTBOOK: UA Foreman Training Manual (UAwebsite available)

INSTRUCTOR RESOURCES:
- Understanding the Full Cost of a Labor Hour curriculum
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

HVAC and Refrigeration Systems

OVERVIEW: This Blackboard™ course covers all aspects of residential and light commercial heating, ventilation, and air conditioning systems with a focus on the installation, servicing and troubleshooting of HVAC systems.

TOPICS COVERED: Heating and refrigeration fundamentals, psychometrics, building mechanical systems, and electrical and electronic devices and controls.

TEXTBOOK: HVAC and Refrigeration Systems (UAwebsite available)

INSTRUCTOR RESOURCES:
- HVAC Troubleshooting Interactive Module
- Videos and other engaging interactive multimedia
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives
Hydronic Heating and Cooling

**OVERVIEW:** This Blackboard™ course covers the use of hydronics in all types of buildings.

**TOPICS COVERED:** Principles of hydronic heating and cooling, pumps, air management, piping materials and components, system layout, terminal units, controls, and system sizing.

**TEXTBOOK:** *Hydronic Heating and Cooling* (UAwebBook available)

**INSTRUCTOR RESOURCES:**
- HVAC Troubleshooting Interactive Module
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Introduction to Fire Protection Systems

**OVERVIEW:** This Blackboard™ course is an introduction to Automatic Fire Sprinkler Systems designed to provide basic information on Fire Protection Systems.


**TEXTBOOK:** N/A

**INSTRUCTOR RESOURCES:**
- Interactive multimedia
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Math for the Trades Refresher

**OVERVIEW:** This self-paced Blackboard™ course can be used to refresh or assess a student’s knowledge in basic high school math.

**TOPICS COVERED:** Whole numbers, integers, algebra, fractions, decimals, percentages, and measurement.

**TEXTBOOK:** Open source *Prealgebra by the College of the Redwoods, Second Edition*

**INSTRUCTOR RESOURCES:**
- Video lessons and examples
- Editable PowerPoints
- Pre-test and post-tests
- Assignment instructions, tasks and objectives

Medical Gas

**OVERVIEW:** This Blackboard™ course is for instructors teaching Medical Gas Installer 6010 testing and certification.

**TOPICS COVERED:** Laws, codes, rules, listing agencies, and regulations from the federal, state, and local levels pertaining to medical gas and vacuum systems as well as knowledge of product performance, system and system component testing, documenting and recording, and medical gas terminology.

**TEXTBOOK:** *NFPA 99, Health Care Facilities Code*

**INSTRUCTOR RESOURCES:**
- Editable PowerPoints
- Practice exams, Quizzes
- Study guides
Plumbing Service, Maintenance, and Repair

OVERVIEW: This Blackboard™ course includes descriptions and proper application of plumbing systems, components, and tools.

TOPICS COVERED: Plumbing tools, safety, systems, fixtures, fittings, and appliances.

TEXTBOOK: *Plumbing Service, Maintenance, and Repair* - UAwebBook available

INSTRUCTOR RESOURCES:
- Includes Plumbing Service Virtual Training Module
- Plumbing Jeopardy Game
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Soldering and Brazing

OVERVIEW: This Blackboard™ course focuses on the joining methods of soldering and brazing.

TOPICS COVERED: safety and safe work practices, soldering and brazing theory, types and uses of copper tube, uses of solders, brazing rod, and fluxes, joint preparation and assembly, heating equipment and tools, soldered and brazed joints, and performance tests for soldering and brazing.

TEXTBOOK: *Soldering and Brazing*

INSTRUCTOR RESOURCES:
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

STAR Certification Review

This course is currently under revision and is unavailable at this time. Please refer to UAOLR.org to access study guides and the NITC website for more information.

Steam Systems

OVERVIEW: This Blackboard™ course covers steam uses in all types of buildings – residential, commercial, institutional, and industrial.

TOPICS COVERED: steam systems, steam heating principles, low-pressure boilers, steam piping systems, heat transfer units, steam traps, gravity condensate return one and two pipe systems, two pipe mechanical return steam heating systems, vapor, vacuum and variable vacuum steam heating systems, high-pressure boilers, steam generation plants, and steam system operation and maintenance.

TEXTBOOK: *Steam Systems* (UAwebBook available)

INSTRUCTOR RESOURCES:
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives

Use and Care of Tools

OVERVIEW: This Blackboard™ course looks at the proper use and care of hand and power tools.

TOPICS COVERED: Proper tool use, tool care and maintenance, safety, ladders and scaffolds, measurement and layout tools, hand and power tools, pipe joining tools, and specialty tools.

TEXTBOOK: *Use and Care of Tools* (UAwebBook available)

INSTRUCTOR RESOURCES:
- Editable PowerPoints
- Quizzes and Tests
- Assignment instructions, tasks and objectives
Water Supply Systems

OVERVIEW: This Blackboard™ course covers historical perspectives of water supply systems, water sources and treatment, water piping materials, water distribution systems, building water supply systems, sizing building water supply systems, water heating, and water conservation.

TOPICS COVERED: Fittings and supports, system design, thermal expansion, water heaters, and protection of the water supply and building occupants. Current water conservation technologies are included, such as alternative water sources, and water-saving fixtures, appliances, and methods.

TEXTBOOK: Water Supply Systems (UAwebBook available)

INSTRUCTOR RESOURCES:
• Editable PowerPoints
• Quizzes and Tests
• Assignment instructions, tasks and objectives

Welding Practices and Procedures for the Pipe Trades

OVERVIEW: This Blackboard™ course covers welding fundamentals and the proper processes, techniques, and procedures to become competent in the welding field.

TOPICS COVERED: Introduction to welding, shielded metal arc welding (SMAW), gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), other welding and joining processes, weld evaluation and testing, and welding technology.

TEXTBOOK: Welding Practices and Procedures for the Pipe Trades (UAwebBook available)

INSTRUCTOR RESOURCES:
• Editable PowerPoints
• Quizzes and Tests
• Assignment instructions, tasks and objectives

UA Resource Course Sites

The resource course site includes a variety of training content used to supplement existing courses and courses under development. Instructors will be added to these courses to access materials but will not be able to enroll students.

UA ITF Instructor Resource Site

OVERVIEW: In this Blackboard™ resource course instructors are able to self-navigate Blackboard™ resources, get tips from other instructors and actively participate in discussions about their current experiences with Blackboard™.

TOPICS COVERED: Blackboard™ course “How To” videos, easy guides on using Blackboard™, changing passwords, uploading exam view tests, grading assignments, adaptive release,

TEXTBOOK: N/A

INSTRUCTOR RESOURCES:
• How to easy guides
• Instructional Webinars
• Apprentice resources
Understanding the Full Cost of a Labor Hour
For this content please request the Foreman Training Master Course.

OVERVIEW: Content includes both 2nd and 5th year apprentice content explaining the full cost of a labor hour.

TOPICS COVERED: Project labor overhead, wages, benefits, business costs and overhead.

TEXTBOOK: Student workbook

INSTRUCTOR RESOURCES:
- Lesson Plans
- Editable PowerPoints
- Links to video on the UAOLR

UA Interactive Modules
The interactive modules only include virtual activities for student and instructor. They do not contain formal tests or assignments; however, instructors may add their own materials after receiving a copy of the course.

Circuit Builder
(Included in the following master courses: Applied Science of Instrumentation, Basic Electricity Theory, and Building Controls)

OVERVIEW: The Freeform Circuit Builder provides the UA Instructor a resource for demonstrating electrical circuits and components, within the safety of a virtual environment. Preprogrammed interactive exercises challenge the apprentice’s understanding of electrical theory and circuit logic. This interactive application allows students to safely design, assemble, and troubleshoot electrical control circuits within the virtual environment, with “true-to-life” results.

TOPICS COVERED: Electrical circuits, components, schematic diagrams, functional troubleshooting with meters, and wiring of circuits. Free form, bulbs in series, bulbs in parallel, resistors in parallel, resistors in series, switches in parallel, low voltage, pilot duty motor control, low voltage pilot duty motor control, ON-AUTO motor control, and LEAD-LAG switch control.

Crane Signaling

OVERVIEW: This Blackboard™ module contains 3D interactive crane simulations using gaming technology for individual or classroom practice by identifying student crane “Operator” and student “Signal Person.” See also “Virtual Reality Simulations” in this e-Resource.

TOPICS COVERED: Staging, crane signals, crane safety.

INSTRUCTOR RESOURCES:
- Editable Blackboard™ course site

Financial Literacy for Apprentices
(Included in the following master courses: Financial Literacy for Apprentices)

OVERVIEW: This Blackboard™ module contains an interactive multimedia Financial Literacy for Apprentices Game where students choose an avatar, create a budget, answer questions and respond to life challenges.

TOPICS COVERED: Budgets, savings, debt and personal savings.

INSTRUCTOR RESOURCES:
- Quizzes
- Editable Blackboard™ course site
HVACR Troubleshooting
(Included in the following master courses: HVAC and Refrigeration Systems and Hydronic Heating and Cooling)

**OVERVIEW:** This Blackboard™ module contains six 3D Virtual Troubleshooting scenarios where participants will resolve electrical problems pre-configured on an air conditioning packaged rooftop unit. See also “Virtual Reality Simulations” in this e-Resource.

**TOPICS COVERED:** Customer service skills, use of tools, and HVACR service troubleshooting.

**INSTRUCTOR RESOURCES:**
- Editable Blackboard™ course site

Industrial Rigging

**OVERVIEW:** This Blackboard™ module provides a multimedia and video walk through of a lift path, crane signaling and safe rigging practices.

**TOPICS COVERED:** Calculations, crane introduction, crane signaling, sling angles, load transfer, load inversion, multi point lifts, completing and executing a lift plan.

**INSTRUCTOR RESOURCES:**
- Knowledge Check
- Editable Blackboard™ course site

Plumbing Service Virtual Training Scenarios
(Included in the following master course: Plumbing Service, Maintenance, and Repair)

**OVERVIEW:** This Blackboard™ module contains six 3D Virtual Troubleshooting scenarios where participants will resolve common service call requests of increasing difficulty. See also “Virtual Reality Simulations” in this e-Resource.

**TOPICS COVERED:** Customer service skills, use of tools, and plumbing service troubleshooting.

**INSTRUCTOR RESOURCES:**
- Editable Blackboard™ course site
Virtual Reality Simulations

- Crane Signaling Simulation
- HVACR Troubleshooting Simulation
- UA Plumbing Service, Maintenance, and Repair Simulation
The UA Training Department has developed various virtual reality simulation training aids, two of which are now available via the Blackboard™ platform. A request for a Master Course will have to be made following the procedures used to request other Blackboard™ courses. See Blackboard™ section.

These courses engage a student in a virtual world using today’s gaming technology. Please read further to get a better understanding of how the course is used and what the student will experience once engaged in the training via virtual reality.

Virtual Crane Simulator

UA apprentices are currently taught how to signal crane operators and tested using various forms of instruction, from using live cranes to simulating a crane with a fishing pole. The UA has developed a 3D simulation system that will be used to test a person’s knowledge of crane signals without actually having a crane present.

This course was designed to facilitate teaching in the classroom for crane signals as well as a self-paced online activity. By providing apprentices or journeymen an engaging, highly illustrative tool to understand the signals and their outcomes, effective learning transfer is expected.

A signal person (using hand or audible signals) will be able to give instructions to another person playing the role of crane operator. The results of the signal person’s instructions will be displayed on a computer screen, which may be projected onto a larger area if desired. The crane operator may be allowed to see the results of operations on a computer display or not, as determined by the situation.

An evaluator will be able to see the same display that the signal person sees and will be able to evaluate the signal person’s ability based on the results displayed. The crane operator will be given a keyboard to perform 10 to 12 crane signal commands. When instructed by the signal person, the crane operator will execute one of the programmed commands.

There are two different Virtual Crane Simulators, one is for the use of the instructor and is a software package that is downloaded. To get started with the instructors Virtual Crane Simulator application you will need to perform some basic setup procedures.

Download Application Files

First, download the application from the following URL:

http://www.itfinteractivelearningresources.com/ua_craneSimulator_install.exe

This installation file (.exe) is a self-contained file that will allow you to extract all necessary files to your local system.
Extract Application Files

After downloading the file to your computer, navigate to the directory where the file was downloaded. In this example, the file was downloaded to the user’s Desktop.

![Desktop directory with ua_craneSimulator_install.exe file]

Double-click the “ua_craneSimulator_install.exe” file to start the extraction process. The current directory will be displayed as a default.

![7-Zip self-extracting archive]

Enter the location to which you would like to install these files. Remember this location as you will need to navigate to this directory to start the application in the future.

Once the files have been extracted, you will see a folder with the following contents.

Running the Application

The first time you attempt to run the software you will be required to enter and validate a serial number. Be sure to have this number available before you begin.

Use one of the licenses you have been issued. Remember, each serial number can only be activated one (1) time. Double-click on the application named “ua_craneSimulator.exe.”

If you are having problems activating your software or need an additional serial number, please contact Kiva Straser at kivas@uanet.org.
Select Screen Resolution

After running the application, you will be presented with an initial set of configuration options. This screen will allow you to select a desired screen resolution and graphics quality setting. Most likely you can accept the values that are selected by default. If your system seems to run the application poorly you can choose a lower screen resolution and lesser graphics quality to increase performance. Note that leaving the “Windowed” option unchecked will force the application to run Full Screen.

The second version of the Virtual Crane Simulator is available through Blackboard™ and is intended to be used as a self-paced teaching aid. Please see the Blackboard™ section of this catalog for description and procedure instruction on how to obtain a Master copy for use at your training center.

HVACR Virtual System Troubleshooting and UA Plumbing Service, Maintenance, and Repair

For today’s apprentices, game-based systems are becoming more prevalent in many aspects of their experiences.

For this training the apprentice will be informed at the start of the simulation that they are the repair technician tasked with keeping the HVACR system operational. They will be presented with various 3D simulation based activities (Service Calls) and will need to troubleshoot the system as problems arise to keep it running effectively.

This training module will be presented by a virtual instructor that will introduce the students to the simulation activities. The topics introduced are listed below:

1. Learning objectives of the training
2. Game Scenario – Who are you in this game?
3. Meters available in your toolbox
4. How to navigate within the virtual environment
5. How to interact with systems / equipment
6. Tools and tips for successfully working within the simulated environment

The service calls will be the actual “game-play” where the apprentices will be allowed to explore the work environments and own the learning experience. They will be given issues to solve and the tools to do so, but they will not be told how to do so step-by-step. Successfully troubleshooting the system will be achieved when the problem has been identified and the remedy performed. How the student “gets there” is under their control.

The environment for each service call will be as real-world as possible. If the trouble has ramifications that can be displayed in the environment they will be evident to the student. Meters are programmed via truth tables to display accurately, regardless of correct or incorrect placement or meter settings. If an apprentice performs a task during the service call that is dangerous they will be notified that they have done so but the system will not correct their actions. An example of this is placing meter leads across a 3-phase disconnect with the meter set to Ohms. The apprentice will be notified of the danger, but after that notification, the meter dial will be left on the Ohms setting. The student must rectify the situation.
UA Mobile App

- App Navigation
- Resources
Download the UA’s Mobile App to get the most current information from our General President. In the members only section of the app you will find information about organizing, political action, the UA Journal and a trenching safety reference. You will also find instructor training resources and recruitment information from the previous app. The UA’s Mobile App can be downloaded by visiting your App Store and searching for “United Association” or scan the QR code below. Once you have downloaded the app you can log in by entering your membership card number and last name as your login credentials.

Navigation Around the App

- Join the UA
- News from the UA
- Notifications
- Who We Are
- Organizing
- Careers and the Markets We Serve
- UA Political Action
- Built on Excellence
- UA Online
- Training Docs
- Resources –UA Constitution, Ritual of the UA, UA Leadership
- DONATE HERE to the UA Charitable Fund
- COVID-19
- Trenching Reference

Click on the Training button within the UA Mobile App to connect to these valuable resources:

Instructor Training Program

- Class Schedule
- Student Course Schedule
- Assistance
- Campus Maps
- Live Video
- Brochure
- Event Photos
- Instructor Evaluations

Training Program Resources

- UAOLR
- Regional Training Catalog
- e-Resource Training Catalog
- UA Bookstore
Recruitment

- Industry Career Videos
- Parents/Counselors
- Women of the UA
- Veterans VIP Site
- UA Apprenticeship Brochure

UA Training News

The App can be downloaded by visiting your App Store and searching for “United Association.”

UA MOBILE APP
Interactive Curriculum App

• Apps Utilized
• Supporting Platforms
The UA's Interactive Curriculum App was designed to provide additional teaching resources to UA instructors and UA students. The App takes pages of the textbooks and overlays Augmented Reality (AR) over live view world, utilizing the camera on the students phone or tablet. The AR appears as a three-dimensional image that seems to jump off the pages of the textbooks.

The Interactive Curriculum App can be downloaded by visiting your App Store and searching for “Interactive Curriculum” or scan the QR code below.

Current UA Textbooks Utilizing Augmented Reality

- Basic Electricity Theory
- Drawing Interpretation and Plan Reading
- HVAC and Refrigeration Systems
- Hydronic Heating and Cooling
- Plumbing: Service, Maintenance, and Repair
- Pumps
- Soldering and Brazing
- Use and Care of Tools
- 360° Video HVAC-R Scenario (New)
  This allows students to walk-through the first scenario of the HVAC-R training in a virtual world using 360° video technology. Using the Oculus Rift or the YouTube app on a mobile device, users can freely navigate video segments in a panoramic environment

Supporting Platforms

- Apple
- Apple iPhone
- Apple iPad
- Android
- Android phones
- Android tablets

Apprentice Hours App
Apprentice Hours Application

The Apprentice Hours Application (or AHA) is a web-based application that eliminates the tedious paper-based systems currently used to track apprentice work hours. It will allow apprentices to log their job hours, allow instructors, journeymen or employers to review and modify time entry information, and allow users to generate reports for compliance.


Questions about registration? Contact Kiva Straser at kivas@uanet.org or (410) 269-2000.
Recruitment Materials

- Recruitment Videos
- Customizable Videos
- Virtual Reality for Recruitment
- Recruitment Materials
Below you will find a list of recruitment/training videos produced by the UA's International Training Fund. The recruitment videos range from the basic all pipe trades recruitment video to individual craft videos i.e. Fire Sprinkler Fitter, Plumber, etc. plus videos that are targeted to the parents and counselors of possible applicants.

The list of videos below comes with a short description of the video. Click on the video title (hyperlink) to view in your internet browser. Please feel free to use the videos for your outreach efforts and feel free to link them from your own JATC website too.

General Recruitment Videos

**Earn While You Learn with the United Association**
A general pipe trades recruitment video

**UA: The Best Training, The Best Jobs**
A general pipe trades recruitment video

**UA: The Right Fit**
A general pipe trades recruitment video

**Women of the United Association**
A recruitment video for attracting women in the UA

**I AM: Women in Piping Careers with the United Association**
A recruitment video for attracting women in the UA

**Women in the United Association Pipe Trades**
A recruitment video for attracting women in the UA

**Standard for Safety**
The United Association's promotion of safety standards

**Spanish Language Recruitment Video**
A recruitment video for attracting Spanish speakers to the UA

Craft Specific UA Career Recruitment Videos - Shortened Versions (minute versions)

**HVACR**

**You See More: HVACR Trailer**
A short introductory video for the You See More-HVACR Recruitment video

**Plumber**

**You See More: Plumbing Trailer**
A short introductory video for the You See More-Plumbing Recruitment video

**Sprinkler Fitter**

**Sprinkler Fitter Salary: Career Benefits as a UA Sprinkler Fitter**
A short video highlighting UA sprinkler career benefits
General Recruitment Trades Videos

Learn about a Pipefitter and Steamfitter Career with the UA
A general pipe trades recruitment video focusing on the pipe fitting trade

You See More: Plumbing
A general pipe trades recruitment video focusing on the plumbing trade

Sprinkler Fitter Jobs: Learn About a Career as a UA Sprinkler Fitter
A general pipe trades recruitment video focusing on the sprinkler fitting trade

Welding: A Successful Career in the UA
A general pipe trades recruitment video focusing on the pipe welding trade

You See More: HVAC Recruitment
Recruitment video focusing on the recruitment of HVACR service technicians

Recruitment Videos for Parents, Counselors and Students

UA: The Right Fit (information for counselors)
A general pipe trades recruitment and informational video targeting school counselors of students

UA: The Right Fit (information for parents)
A general pipe trades recruitment and informational video targeting parents

UA: The Right Fit (information for students)
A general pipe trades recruitment and informational video targeting students

Apprentice Plumbing Careers: Training Opportunities with the UA
A plumbing specific video targeting school counselors of students

Sprinkler Fitter Apprenticeship: Career and Trade Training in the UA
A sprinkler fitter specific video targeting school counselors of students

HVACR Classes & Training: How to Start a Career in the HVACR Industry
An HVACR specific video targeting parents/teachers/counselors/students

Help Students Find a Career as a HVACR Service Technician (information for parents/teachers/counselors)
Recruitment video focusing on the recruitment of HVACR service technicians targeting parents/teachers/counselors

Tradeswomen Build Nations Conference Information

The United Association Supports the Tradeswomen Build Nations Conference
A video supporting NABTU’s Tradeswomen Build Nations Conference. For more information, enter your email address for updates here https://nabtu.org/twbn.
Customizable Videos

The International Training Fund has committed to providing quality recruitment material to our local training programs. As part of this effort, the ITF has prepared a set of customizable videos that are designed to be utilized by local training programs as part of their outreach and recruitment. These videos are designed to function not only as a streaming video on a local training program website but also as commercials on local TV channels. Choose from the United Association’s International Training Fund’s customizable 30 or 60 second commercial television/website spots listed below. The ITF will cover the cost of customizing the ending of the video to contain your local training program information. Any other changes requested will be the responsibility of the local to cover the cost. Click on the link below to request your video.

Choice of Video Examples

“Earn While You Learn with the United Association” 60 Second Commercial
“Earn While You Learn with the United Association” 30 Second Commercial
“Alumni: Earn and Learn for Free” 30 Second Commercial
“Alumni: Earn and Learn for Free” 60 Second Commercial
“Apprenticeship the Other 4 Year Degree” 60 Second Commercial
“I AM: Women in Piping Careers” 60 Second Commercial

Screen shot of video ending with your information added here!

Complete the form at the following link bit.ly/uavideos to receive a youtube link and downloadable file for your local union’s personalized video.

Questions concerning custom videos? Contact Kiva Straser at kivas@uanet.org or call (410) 269-269-2000.
Virtual Reality for Recruitment

The UA Training Department has developed The Virtual Reality (VR) Career Experience app. This app can be used to attract new members at career fairs and other recruitment events. The app is now available for download through the App Store (iOS), Oculus Go and Google Play. Once downloaded, you can view this app in any VR headset (low priced VR headsets are available online or at any electronics store). For more information on VR headsets, including Oculus Go and BOBOVR Z4 visit the Recruitment Resources page found here: http://bit.ly/UA360VR

UA Virtual Reality Career Experience

The UA 360° Virtual Reality Career Experience is a first person virtual immersion into the piping trades where potential apprentices can experience firsthand the sights and sounds of being an HVACR Service Technician, Plumber, Sprinkler Fitter, Steam Fitter/Pipe Fitter and Welder. This app features over 20 interactive 360° video scenes to explore. Each scene is narrated and explains the advantages of a career and education with the United Association’s apprenticeship training program.

Training coordinators can use this app with a VR headset during recruitment events to attract potential apprentices. This platform can be used to explain the piping trades and training offered with a registered apprenticeship program to students, parents and administrators. Users at a recruitment event can download this app for use on their mobile device with their personal VR equipment. Once downloaded the app can be shared with friends, family and career influencers.

Any questions about using VR as a recruitment tool and how to set it up please contact Laura Ceja for more information.
Customizable Brochures and Push Cards for Recruiting Events

The International Training Fund has committed to providing quality recruitment material to our local training programs. As part of this effort, the ITF has prepared various printed recruitment material that is designed to be utilized by local training programs as part of their outreach and recruitment. This material is customizable allowing for UA local training programs to customize it to fit your local recruitment and outreach needs. Training directors/coordinators may visit the United Association’s International Training Fund’s “JOIN” website to create an account and order customized trade specific materials. These materials are being provided by the ITF at no cost to your training center up to a specified amount. Push cards and tri-fold brochures are available in quantities of up to 500 and Executive Summaries are available in quantities of up to 50 at no charge. Any quantities requested above these amounts will be the responsibility of the local training program. Please note that the “You See More Executive Summary” specific for HVACR, Fire Protection and Plumbing are not customizable. Spanish language push cards and tri-fold brochures are available in the “Join” format only.

To request access to this site to order material, training directors/coordinators please request access by clicking on the link: www.UAjoin.org.

Questions on ordering recruitment brochures and push cards? Contact Kiva Straser at kivas@uanet.org or call (410) 269-2000.

General Recruitment Materials

“Join” Push Cards

(front) (back)

“Join” Push Cards Women

(front) (back)
The United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry, affiliated with the national building trades, represents approximately 348,000 plumbers, pipefitters, sprinkler fitters and service technicians worldwide.

For more information, please visit www.ua.org.

JOBS
TAKE ADVANTAGE OF ONE OF MANY SKILLED APPRENTICESHIP TRAINING PROGRAMS TODAY TO ENSURE A BETTER TOMORROW FOR YOU AND YOUR FAMILY.

UNITED ASSOCIATION OF PLUMBERS, PIPEFITTERS AND SERVICE TECHNICIANS
THREE PARK PLACE
ANNAPOLIS, MD 21401
P: 410-269-2000
Fire Protection:
“You See More” Tri-Fold Brochure

Plumbing Service:
“You See More” Tri-Fold Brochure

Steamfitting and Pipefitting:
“You See More” Tri-Fold Brochure

Recruitment Materials
Welder:

“You See More” Tri-Fold Brochure

“You See More” Executive Summary
International Training Fund
Three Park Place
Annapolis, Maryland 21401