ELA Institute for Facility Management Education

FALL 2026

Building Operators' Certificate
Facility Maintenance Certificate
HVAC Continuing Education
Electrical Continuing Education
Hands On Labs




Operated by

The Electric League of Arizona

The Arizona Heat Pump Council

Sponsored by

ELA Institute for Facility Management Education

The Institute - The ELA Institute for Facility Management Education offers educational programs to meet the unique continuing educational and training needs of facility managers and their personnel. The ELA Institute is operated by the Educational Departments of the Electric League of Arizona and the Arizona Heat Pump Council. The curricula for the Institute's educational programs were developed by industry practitioners and educators, associated with the ELA and the AHPC, the lead instructors for both organizations, and the Energy Efficiency Department at APS. These programs are designed for a wide range of facility management personnel, including maintenance technicians, and managers of large, complex, multi-facility organizations.

The Electric League of Arizona - The Electric League of Arizona is a multi-industry trade association supporting the electrical, HVACR and energy management industries through education, founded in 1960; publications, including trade and consumer newspapers and Buyers' Guide; consumer referral services and other utility trade ally programs. The Electric League of Arizona also provides the HVACR Continuing Education Program offered by the Arizona Heat Pump Council and the Electrical Continuing Education Program offered in conjunction with GateWay Community College.

The ELA Institute for Facility Management Education opened its doors in the fall of 2002 with the first Facility Maintenance Technician Program. To date, The Institute has graduated over 780 students in this program. These students represent over 325 companies through out the state of Arizona. The Building Operators' Certificate Program was added to the Institute in the fall of 2003. The Institute has registered over 298 students, representing over 210 companies state wide. The Institute's instructors are expert practitioners in their specific field and bring a wealth of up to date knowledge to each class.

Customized Workshops Available

The ELA Institute for Facility Management Education Customized Workshops.

Hosted at the ELA Training Center, on-line, or at your location. Workshops are customized for your needs.

- Fifteen or more participants
- Half Day or Full Day
- **Trainings Available:**
  - **NFPA 70E**
  - **NEC Code Update**
  - **Power Quality**
  - **Commercial Refrigeration**
  - **Grounding & Bonding**
  - And More...

Contact: Anne Dozeman, Director of Education
Email: adozeman@elaz.org
Phone: 602-263-0115

ELA 13 - NEC 2023 - CODE UPDATE WORKSHOP

This 2-evening class will cover modifications in the NEC and discuss why the rule changes were made. Topics also include safety aspects of the NEC changes, conflicting rule changes, how to apply rule changes to real-world projects, and how the rule changes affect overhead costs.
Note: Course fees include a copy of the National Electric Codebook and lunch.
($50 off for those w/Codebooks)

DATES:	Tues & Thur Oct.. 27 & 29 2026
TIMES:	5:30 p.m. - 7:30 p.m.
INSTRUCTOR:	Mark Cook
FEES:	$270 Mbr/$300 Non-Mbr

$100.00 Discount if you already have the 2023 NEC Code Book

REGISTER ONLINE AT: EDU.ELAZ.ORG

ELA Institute for Facility Management Education

Facility Maintenance Technician Program

Sponsored by SRP® Operated by

About the Program:
This program has been designed by industry educators and practitioners, associated with the Electric League of Arizona's education department and the Arizona Heat Pump Council. This session will be taught by one of the League's electrical instructors and a lead instructor for the Arizona Heat Pump Council education program. Upon completion of this 16 week 2 nights a week program, successful students will receive a Certificate of Completion and Facility Maintenance Master Technician Patches. (A "C" average or better is required for successful completion.)

Course Coverage

(Order and content is subject to change)

HVAC Curriculum:
The HVAC training will include a comprehensive review of refrigeration system fundamentals, refrigerants, HVAC equipment, air movement and measurement, air quality, residential and commercial systems, air & water source heat pumps.

- Refrigeration Theory I
- Refrigeration Theory II
- Refrigeration Components
- Introduction to Refrigerants
- Charging & Piping
- A/C Control Systems I
- A/C Control Systems II
- Review & Quiz
- Refrigerators & Freezers
- Residential Systems - Air Conditioning
- Residential Systems - Heat Pumps
- Commercial Systems
- Air Quality & Distribution (Air Flow)
- HVAC Systems Troubleshooting
- Servicing Commercial Systems
- Review & Final Exam

Electrical Curriculum:
The electrical training will include a comprehensive review of basic electrical fundamentals; practical installation, operation, maintenance, and troubleshooting techniques, with an emphasis on electrical safety procedures.

- Concepts of Electricity I
- Concepts of Electricity II
- Basic Circuitry I
- Basic Circuitry II
- Basic Circuitry III
- Commercial & Industrial Buildings Practical AC Circuits
- Commercial & Industrial Practical AC Power Delivery
- Building Systems Control Systems
- Electrical Codes & Standards
- Basic AC/DC Rotating Electrical Machinery
- Variable Frequency Drive Systems I
- Variable Frequency Drive Systems II
- Electrical Power Quality Commercial & Industrial
- Electrical Troubleshooting I
- Electrical Troubleshooting II
- The Importance of Electrical Safety

Facility Maintenance Program Registration

Tuition (Space is limited register early) (Tuition includes all books and applicable fees)
$1,185 ELA Member/$1,235 Non-Member
Dates: August 11 - December 3, 2026 • Tuesdays & Thursdays
Time: 5:30 p.m. - 8:20 p.m.
Location: Electric League Training Center, 2702 N. 3rd Street Suite 2020, Phoenix, AZ 85004

Scan QR Code to Register

Student Name:_____ Date: _____

Company: _____ Contact person: _____

Daytime Phone:_____ **E-mail: _____ **Fax: _____

Mailing Address:_____ City:_____ State:AZ Zip: _____

Are you a member of the Electric League of Arizona? ❑ Yes ❑ No

Method of Payment: **Payment must be received prior to start of class.**

Total: $ _____ ❑ Check enclosed #:_____ ❑ M/C ❑ Visa ❑ AMEX

(All credit card receipts will be sent to the email address you provide above.)

Credit Card #: _____ 3 Digit Code:_____ Exp Date: _____

Exact name on card: _____ Signature: _____

Billing Address if different: _____ State:AZ Zip: _____

Cancellation Policy: A full refund will be issued only if written notice of cancellation is received **seven (7) days** prior to the class start date. All registration received by mail, emailed or fax are con-firmed registrations, unless canceled within the proper time frame. All courses are subject to cancellation if minimum enrollment requirements are not met. **No-shows:** participants are charged the full amount if they register but do not attend. Due to the number of classes we hold each season, we do not provide confirmation. _____ Please initial here indicating you have read and understand the cancellation policy.
**We may use this fax number or email address to inform you of similar educational courses.

Please return application and fees to:
Electric League of Arizona - 2702 N. 3rd Street Ste. 2020, Phoenix, Arizona 85004
Fax 602-274-0029 or call 602-263-0115 for more information.

REGISTER ONLINE AT: EDU.ELAZ.ORG

Building Operators' Certificate Program

The ELA Institute for Facility Management Education presents an educational program leading to a certificate in Building Operations. The certificate will be of most benefit to managers with total responsibility for multi-facilities, as well as those with single facility responsibility.

The Faculty is composed of the lead instructors for the Education Departments of the Electric League of Arizona and the Arizona Heat Pump Council; APS energy personnel; SRP energy personnel; and guest instructors, as appropriate. The program is offered eight hours a day, one-day a week for 8 weeks at the ELA Institute located in the Electric League of Arizona Education Center.

Eight Full Days of Workshops - Descriptions Listed Below

Cost: Non-Members $1950; Members $1875.
Time: 9:00 a.m. - 5:00 p.m.
Single workshope prices are listed on pages 4 & 5.

Scan the QR Code to Register

Building Operator's Certificate Program Spring 2026 Schedule

DATE	TOPIC	INSTRUCTOR
Wednesday, Sept. 16, 2026	FME 101 - HVAC Fundamentals in a Commercial/Industrial Facility	Kevin Styles
Wednesday, Sept. 16, 2026	FME 102 - Airflow Dynamics for the Commercial/Industrial Facility	Kevin Styles
Wednesday, Sept. 23, 2026	FME 107 - Lighting Fundamentals & Efficiency	Dave Inman
Wednesday, Sept. 23, 2026	FME 103 - HVAC Code & Safety for the Commercial/Industrial Facility	Travis Howard
Wednesday, Sept. 30, 2026	FME 104 - Electrical Codes and Standards for Comm/Industrial Facility	Mark Cook
Wednesday, Oct. 7, 2026	FME 106 - Electrical Safety, NFPA 70E	Marc Ramirez
Wednesday, Oct. 14, 2026	FME 108 - Power Quality for the Commercial/Industrial Facility	Ed Weiss
Wednesday, Oct. 21, 2026	FME 112 - Direct Digital Controls	Kevin Styles
Wednesday, Oct. 21, 2026	FME 109 - Indoor Air Quality	Derrick Denis
Wednesday, Oct. 28, 2026	FME 115 - Design & Operation of Commercial Chilled Water Systems	Kevin Styles
Wednesday, Nov. 4, 2026	FME 110 - Energy Conservation Techniques; FME 111 - Energy Audit	Amy Ferguson

Course Descriptions

FME 101

HVAC FUNDAMENTALS IN A COMMERCIAL/INDUSTRIAL FACILITY

Date: Wednesday, Sept. 16, 2026
Fees: $365 Mbr / $395 Non-Mbr
Time: 9:00 a.m. - 12:00 p.m.

***Text Book Included:**
Modern Refrigeration ($200.00 value)
Course Description: A discussion of commercial systems, chiller systems, and A/C control systems in a modern industrial setting.

- Reviews heating, cooling, and ventilation
- Commercial systems and their applications
- Commercial condensers, evaporators and compressors
- Centrifugal, screw, scroll and reciprocating applications
- Types of chillers and their applications
- A/C Control Systems
- Work with specific systems diagrams
- Chiller Systems
- Specific HVAC Controls
- KW per ton and energy usage

FME 102

AIRFLOW DYNAMICS FOR THE COMMERCIAL/INDUSTRIAL FACILITY

Date: Wednesday, Sept. 16, 2026
Fees: $170 Mbr / $200 Non-Mbr
Time: 1:00 p.m. - 5:00 p.m.

***A/C Duct Calculator Included**

Course Description: A thorough understanding of airflow dynamics can enable you to uncover and resolve system problems.
Course Content: An overview of what causes most airflow related problems and how they can be prevented.

- Airflow dynamics
- Central air systems
- Airflow systems and components
- Variable speed fans and pumps
- Ventilation requirements for HVAC
- Types of fans
- Airflow testing and instruments

FME 103

HVAC CODES AND SAFETY FOR THE COMMERCIAL/INDUSTRIAL FACILITY

***Text Book Included:**
2024 International Mechanical Codebook ($150.00 Value)

Date: Wednesday, Sept. 23, 2026
Fees: $300 Mbr/$330 Non-Mbr
Time: 12:00 p.m. - 5:00 p.m.

Course Description: A discussion of local and national health, safety, energy and environmental codes as they relate to the HVAC system in a Commercial/Industrial Facility.
Course Content: An overview of codes, standards and specifications and how they apply in a Commercial/Industrial Facility.

FME 104

ELECTRICAL CODES AND STANDARDS FOR THE COMMERCIAL/INDUSTRIAL FACILITY

Date: Wednesday, Sept. 30, 2026
Fees: $365 Mbr / $395 Non-Mbr
Time: 9:00 a.m. - 5:00 p.m.

***Text Book Included**
2023 National Electrical Code Book
Course Description: Electrical, energy management and related codes that facility managers must know.
Course Content: Compliance with the most important maintenance related codes and their application to an energy efficient building.

Sample Daily Schedule

8:45 - 9:00 Registration & Refreshments
9:00 - 10:30 - Session 1
Break & Refreshments
11:15 - 12:00 - Session 2
Catered Lunch
1:00 - 2:30 - Session 3
Break & Refreshments
2:45 - 4:30 Session 4
4:30 - 5:00 - Quiz & Questions

Course Coverage continued

FME 106

ELECTRICAL SAFETY FOR THE COMMERCIAL/INDUSTRIAL FACILITY

Date: Wednesday, Oct. 7, 2026
Fees: $365 Mbr/$395 Non-Mbr
Time: 9:00 a.m. - 5:00 p.m.

Course Content: An overview of safety practices related to electricity and how it relates to the Commercial/Industrial Facility.

- Recommended safety practices
- OSHA Codes

***Text Book Included: NFPA 70E**

FME 107

LIGHTING FUNDAMENTALS AND EFFICIENCY FOR THE COMMERCIAL/ INDUSTRIAL FACILITY

Date: Wednesday, Sept. 23, 2026
Fees: $170 Mbr/$200 Non-Mbr
Time: 9:00 a.m.- 12:00 p.m.
Location: Lighting Unlimited, 1550 E. Washington St., Phoenix, AZ

Course Description: A broad-based discussion of lighting fundamentals and efficiency and how they're applied to a Commercial/Industrial Facility.

- Lighting fixture technology and efficiency
- Applications and Strategies
- Light Source/Efficiency/Common Retrofits
- Lighting maintenance

FME 108

POWER QUALITY FOR THE COMMERCIAL/ INDUSTRIAL FACILITY

Date: Wednesday, Oct. 14, 2026
Fees: $230 Mbr/$260 Non-Mbr
Time: 9:00 a.m. - 5:00 p.m.

Course Description: The basics of important, "Need to know" power quality issues in your facility. Learn as the instructor performs a real, hands-on analysis of a large facility.
Course Content: An overview of what causes most Power Quality related problems and how they can be prevented.

- Techniques for identifying PQ symptoms
- Trouble-shooting common problems

FME 109

INDOOR AIR QUALITY FOR THE COMMERCIAL/INDUSTRIAL FACILITY

Date: Wednesday, Oct. 21, 2026
Fees: $170 Mbr/ $200 Non-Mbr
Time: 1:30 p.m.- 5:00 p.m.

Course Description: The purpose of this course is to familiarize the attendees with Indoor Air Quality (IAQ) and Indoor Environmental Quality (IEQ).
Course Content: This course will familiarize attendees with common IEQ issues and terminology. Attendees will receive an introduction on how to anticipate, recognize, prevent and respond to common IEQ issues that impact the facilities. Attendees will receive an:

- Introduction to common contributors to poor IEQ.
- Familiarization with the common IEQ terms.
- Introduction to broadly applicable prevention, assessment and response concepts.
- Comprehension of the health effects, building consequences and other liabilities associated with poor or mismanaged IEQ.
- Acquaintance with example preventative actions, such as controlling outside air, regular HVAC filter replacement, managing pests, addressing water releases, reducing Legionella in water systems, etc.
- Understanding of various response actions to IEQ issues such as asbestos releases, sewer line breaks, and visible mold growth.

FME 110/FME 111

ENERGY CONSERVATION TECHNIQUES/ ENERGY AUDIT

Date: Wednesday, Nov 4, 2026
Fees: $170 Mbr/$200 Non-Mbr
Time: 9:00 a.m. - 12:30 p.m.

FME 110

Course Description: The use of energy in commercial buildings and how to identify and prioritize conservation opportunities.

Course Content: An overview of the basics of energy accounting, evaluation of fuel options, operation and maintenance strategies to improve efficiency, and energy management planning techniques.

- Implementing an effective energy management program
- Use of infrared technology to measure thermal losses
- Developing an energy efficiency "checklist" for a facility

FME 111

Course Description: The essentials that a building operator should know about how to measure the energy performance of their facilities.

Course Content: An overview of where your facility uses energy and how your facilities' energy use compares to your competitors.

- Where do you spend the most
- Where are the opportunities for savings
- Techniques for studying your energy usage history
- Download your account data into spreadsheets to analyze usage
- Analyze energy end-use data that shows typical energy breakdowns for different types of facilities
- Essential for operators who manage multiple facilities

FME 112

DIRECT DIGITAL CONTROLS

Date: Wednesday, Oct. 21, 2026
Fees: $170 Mbr/$200 Non-Mbr
Time: 9:00 a.m. - 12:30 p.m.

Course Description: An introduction to the application of Direct Digital Controls (DDC) to operating a building's temperature control system.

Course Content: Topics will include:

- The ability of the system to process data
- Input & output types, transducers, variable frequency drive (VFD) theory, communication protocols (LON & BACnet), programming vs. configuring controllers
- Workstation basics
- How to make the controls act like an Energy Management System (EMS).
- Specific manufacturers will not be covered, only the overall theory of how these systems operate.

FME 115

DESIGN & OPERATION OF COMMERCIAL CHILLED WATER SYSTEMS

Date: Wednesday, Oct. 28, 2026
Fees: $270 Mbr/$300 Non-Mbr
Time: 9:00 a.m.- 5:00 p.m.

What You Can Expect: This class provides an overview of the design and operation of Building Chilled Water Systems including piping system design and unit components.

Piping System Design

A. Direct & Reverse Return Piping Systems
B. Pipe Sizing
C. Piping Specialties
D. Flow Control

Equipment

A. Pumps
B. Chillers
C. Terminal Units (Air Handlers, Fan Coil Units, Coils)
D. Cooling Towers
E. Compression-Expansion Tanks

REGISTER ONLINE AT: EDU.ELAZ.ORG

ORDER AND CONTENT SUBJECT TO CHANGE

Building Operators' Certificate Program Registration

Sponsored by SRP Operated by ELA

Student Name:_____ Date:_____

Company: _____ Position: _____

***E-mail:_____ Daytime Phone:_____

Mailing Address:_____ City:_____ State:_____ Zip:_____

Contact:_____ Are you a member of the ELA? ❑ Yes ❑ No

***We may use your email address to inform you of similar educational courses.

Rates	Non-Member Rate	Member Rate
❑ **Full Certificate Program Registration**	**$1,950**	**$1,725**

Dates: Sept 16 - Dec 2, 2026 *(Eight Wednesdays)*
Time: 9:00 a.m. - 5:00 p.m.
Location: Electric League Training Center, 2702 N. 3rd Street Suite 2020, Phoenix, AZ 85004

À la Carte Course Registration

_____FME 101 Fundamentals for the Commercial/Industrial Facility*……	$365……..	$335
_____FME 102 Airflow Dynamics for the Commercial/Industrial Facility.....	$200……..	$170
_____FME 103 HVAC Codes and Safety for the Commercial/Industrial Facility*…..	$330……..	$300
_____FME 104 Electrical Codes and Standards for the Comm/Industrial Facility*…..	$395……..	$365
_____FME 106 Electrical Safety for the Commercial/Industrial Facility*…….....	$395……..…	$365
_____FME 107 Lighting Fundamentals & Efficiency……	$200……..…….....	$170
_____FME 108 Power Quality for the Commercial/Industrial Facility……..…	$260……..…	$200
_____FME 109 Indoor Air Quality for the Commercial/Industrial Facility……..…	$200……..…	$170
_____FME 110/FME 111 Energy Conservation Techniques/Energy Audit……...	$200……..…	$170
_____FME 112 Direct Digital Controls for the Commercial/Industrial Facility…..…..	$200……..	$170
_____FME 115 Design & Operations of Commercial Chilled Water Systems……..…	$300……..	$270
	Sub Total_____	Sub Total_____

*** Text books included in the full program and à la carte fee**

• Full-day courses include continental breakfast, lunch, and beverages

*****Cancellation Policy:** A full refund will be issued only if written notice of cancellation is received **seven (7) days** prior to the class start date. All registrations received by mail or fax are confirmed registrations, unless cancelled within the proper time frame. All courses are subject to cancellation if minimum enrollment requirements are not met. No-shows: participants are charged the full amount if they register but do not attend. Due to the number of classes we hold each season, we do not provide confirmation. _____ Please initial here indicating you have read and understand the cancellation policy.

Method of Payment Payment must be received prior to start of class.

Total: $ _____ ❑ Check enclosed #: _____ ❑ M/C ❑ Visa ❑ AMEX

Credit Card #: _____ 3 Digit Code: _____ Exp Date: _____

Exact name on card: _____ Signature: _____

Billing Address if different: _____ State:AZ Zip:_____

REGISTER ONLINE AT: EDU.ELAZ.ORG

Please mail registration and payment to: Arizona Heat Pump Council • 2702 N. 3rd Street, Suite 2020
Phoenix, AZ 85004 Or fax to: 602-274-0029 • Call 602-263-0115 for more information

ELECTRICAL TECHNOLOGY COURSES
Certificate Programs

Register at the Electric League, classes held at GateWay CC, ELA & Hybrid

RESIDENTIAL WIRING CERTIFICATE

Prerequisites: None

Description: This certificate program is specifically designed to provide a foundation of fundamental electrical knowledge and skills in residential applications. These include use of tools, applied calculations, theories and concepts of electricity and electronics, residential wiring and codes. The Certificate of Completion (CCL) lays the framework for the International Code Council (ICC) and International Association of Electrical Inspectors (IAEI) certification exams. Students are admitted to the Certificate of Completion (CCL) in Electrical Technology-Residential Wiring Program only through the Electric League of Arizona. Upon successful completion, the student will be prepared to progress to the Commercial Wiring Certificate Program.

Required Courses:

ELC 103	Electrical/Mechanical Calculations
ELC 119	Concepts of Electricity & Electronics
ELC 123	Residential Electrical Wiring & Codes
ELC 160	Applied Electrical Codes
ELC 164	Grounding & Bonding

COMMERCIAL WIRING CERTIFICATE

Prerequisites: Completion of the Residential Wiring Certificate Program or permission of instructor.

Description: This Certificate Program builds upon your knowledge of residential applications and provides you with greater depth in skills and commercial electrical applications. Upon successful completion of the series you will be awarded a Certificate of Completion and will be prepared to advance to the Industrial Wiring Certificate Program.

Required Courses:

ELC 120	Solid State Fundamentals
ELC 161	Applied Electrical Codes II
ELC 217	Electric Motor Controls
ELC 125	Commercial Electrical Wiring & Codes

INDUSTRIAL WIRING CERTIFICATE

Prerequisites: Completion of Commercial Certificate Program or permission of the instructor.

Description: This Certificate Program continues to develop your knowledge of advanced electrical skills, typical of industrial applications. Upon successful completion of this series you will be awarded a Certificate of Completion and will be prepared to advance to the Electrical Technology Associate's degree program.

Required Courses:

ELC 124	Industrial Wiring and Codes
ELC 144	Basic Automated Systems Using Programmable Controllers
ELC 210	AC/DC Machinery
ELC 218	Variable Frequency Drives

CERTIFICATE OF COMPLETION IN ELECTRICAL TECHNOLOGY

Description: This Electrical Technology Program is designed to provide students with a broadened educational background and leadership skills in facilities management. This expertise will allow employment within the industry in the areas of management, sales, field service, business ownership or instruction.

Requirements: Completion of the Electrical Technology Wiring Certificate Program in Residential Wiring, Commercial Wiring, and Industrial Wiring (39 Credits Total)

Cancellation Policy

A full refund will be issued only if written notice of cancellation is received 7 days prior to class starting date.

All classes subject to cancellation if minimum enrollment requirements are not met. Financial aid students must pay ELA the full fee and claim back the financial aid from Gateway.

ASSOCIATE OF APPLIED SCIENCE IN ELECTRICAL TECHNOLOGY

(Issued by GateWay Community College)

Requirements: 60-64 Credits Total
2.0 GPA Overall

Technical Program: 39 Credits
General Studies: 22-25 Credits

Classes		**Credits**
Technical Program:		
ELC 144	Basic Automated Systems Using Programmable Controllers	3
ELC 119	Concepts of Electricity & Electronics	3
ELC 120	Solid State Fundamentals	3
ELC 123	Residential Electrical Wiring & Codes	3
ELC 124	Industrial Electrical Wiring & Codes	3
ELC 125	Commercial Electrical Wiring & Codes	3
ELC 160	Applied Electrical Codes	3
ELC 161	Applied Electrical Codes II	3
ELC 164	Grounding & Bonding	3
ELC 210	AC/DC Machinery	3
ELC 217	Electric Motor Controls	3
ELC 218	Variable Frequency Drives	3
ELC 103	Electrical/Mechanical Calculations	3
General Studies:		
ENG 101	First Year Composition	3
ENG 111	Technical Writing	3
COM 230	Small Group Communication	3
CRE 101	Critical Reading (Or equivalent by assessment)	3
MAT 122	Intermediate Algebra (Or equivalent by assessment)	3
HUM 101	General Humanities	3
CHM 130	Fundamental Chemistry	3
CHM 130LL	Fundamental Chemistry	1
SOC 101	Introduction to Sociology	3

-Registration for Electrical courses through The Electric League of Arizona.

-Registration for General Studies courses is through GateWay Community College.

-Contact education@elaz.org to begin your registration process.

Electrical Courses

Unless noted, ELC classes earn three college credits and meet once a week. A $15 Gateway registration fee applies per student.
Textbooks are additional and may be purchased from the publisher or online retailer.
**NOTE: Students must be properly admitted to GateWay College and meet the enrollment criteria to register for ELC courses.

16-Week Classes

ELC 119 - CONCEPTS OF ELECTRICITY & ELECTRONICS

Dates: Mondays, Aug. 24-Dec 15, 2026
Time: 5:50 p.m. - 9:10 p.m.
Location: ELA Training Center

Introduction to theory and principles of electric circuits, magnetism and electromagnetism including basic motors, transformers and generators. Use of basic measuring instruments. Overview of Ohm`s and Kirchhoff`s law and electronics in the modern world.

ELC 103 - ELECTRICAL/ MECHANICAL CALCULATIONS

Dates: Tuesdays, Aug 25-Dec 16, 2026
Time: 6:00 p.m. - 9:10 p.m.
Location: GateWay College

Fundamental calculations in arithmetic, algebra, trigonometry, descriptive geometry, economics, and probability. Application of theories and formulas to solve design, installation, maintenance, and troubleshooting problems for industrial, commercial, and residential electrical and mechanical systems

ELC 125 - COMMERCIAL ELECTRICAL WIRING & CODE

Dates: Tuesdays, Aug 25-Dec 15, 2026
Time: 6:00 p.m. - 9:10 p.m.
Location: GateWay College/On-Line

Commercial electrical power distribution techniques of low voltage (under 600 volt) systems. Selection of electrical distribution components, single and three systems, one-line diagrams and conductor selection. System grounding, planning and over current protection.

- **Contact the ELA at (602) 263-0115 or education@ elaz.org regarding payment status for class(es).**
- **Please notify ELA right away if plan to utilize Financial Aid (FA).**
- **Electrical Courses can be taken individually, as part of a certificate, or as part of the GateWayCC Associate of Applied Science in Electrical Technology.**
- **4-5 courses in the electrical program sequence are offered on a rotating basis.**
- **Each class is offered at least once every two years. Please plan your academic goals accordingly.**

ELC 144 - BASIC AUTOMATED SYSTEMS USING PROGRAMMABLE LOGIC CONTROLLERS (PLCs)

Dates: Wed., Aug 26-Dec 16, 2026
Time: 6:00 p.m. - 9:10 p.m.
Location: Electric League of Arizona

Principles of automated control systems. Principles and application of programmable controllers, control functions, hardware, logic, programming, documentation, troubleshooting, start-up, maintenance and operation.

ELC 210 - AC MACHINERY & DC MACHINERY

Dates: Thur., Aug 27 - Dec 17, 2026
Time: 6:00 p.m. - 9:10 p.m. ELA
Location: Training Center

Principles and operation of AC (Alternating current) and DC (direct current) motors, generators, and alternators. Includes single-phase motors along with induction, synchronous, and wound-rotor types of three-phase

Solar/PV Seminar

*Non-College Credit

ELA 30 - UNDERSTANDING PHOTOVOLTAIC INSTALLATION ELECTRICAL CODES

Dates: Thurs. & Fri., Oct 8 & 9, 2026
Time: 8:00 a.m. - 4:00 p.m.
Instructor: Mark Ode
Fees: $425 Mbr/$485 Non-Mbr

Develop a comprehensive understanding of how solar PV systems work and the requirements needed for proper installations. Various crucial subjects, such as wiring techniques, grounding standards, and disconnection requirements will be discussed. Includes instruction covering Article 690, theory behind PV installation requirements and other pertinent sections of the NEC.

Seminars

*Non-College Credit at ELA Training Cntr.

ELA 45 - ELECTRICAL EQUIPMENT AND MAINTENANCE

Date: November 13, 2026
Time: 8:00 a.m. - 4:30 p.m
Instructor: Mark Cook
Fees: $270 Mbr/ $300 Non-Mbr

•Who is responsible for the maintenance of the equipment.
•Understanding why compliance is required and the linkage between NFPA 70, 70E and 70B for compliance with the electrical cycle of safety
•Guidance on establishing an (EMP) Electrical Maintenance Program with an EMP coordinator.
•Who is the AHJ and when Manufacturer instructions are required.

ELA 40 - ELECTRICAL GROUNDING & BONDING

Dates: Wed & Thur, Sept. 9 & 10, 2026
Time: 5:30 p.m. - 8:30 p.m.
Instructor: Mark Cook
Fees: $270 Mbr/$300 Non-Mbr

This two-eveningseminar will allow participants to interpret code requirements as they relate to Article 250 and other articles of the NEC. Participants will be provided with an in-depth review from theory to important principles of grounding and bonding.

- Explore the performance goals of grounding
- Know when to ground and when not to ground
- Examine key terms to identify specific Code requirements
- Look at qualifying grounding electrodes and the installation requirements

Who Should Attend: Highly recommended for entry level electrical workers, maintenance technicians, engineers, building managers or anyone wanting a better understanding of grounding and bonding.
Fees include a copy of the 2023 NEC.

ELA 70 - ELECTRICAL SAFETY FOR COMMERCIAL INDUSTRIAL FACILITIES

Date: Wednesday, October 7, 2026
Time: 9:00 a.m. - 5:00 p.m.
Instructor: Mark Ramirez
Fees: $270 Mbr/$300 Non-Mbr

This one-day class will cover an overview of NFPA 70E including: Arc Flash & Arc Blast Hazards, Flash Protection & approach boundaries, Hazard Risk Categories & selection of appropriate PPE. Lockout Tagout procedures, general Electrical Safety related to electricity in Commercial and Industrial facilities. Recommended Safety practices and OSHA Codes. **Fees include breakfast, lunch and NFPA 70E, hand-outs**.

Electrical Course Registration

*Please read all areas of the registration portion of this form carefully and complete all necessary lines.

Student Name:_____ Date: _____

Company: _____ **Email _____

Position: _____ Student ID:_____

Mailing Address:_____ City: _____

State: AZ Zip: _____ Daytime Phone: _____ **Fax#: _____

Contact Person/Company Responsible for Payment:_____

**We may use this fax number to inform you of similar educational courses.

Are you a member of the ELA? ❑ yes ❑ no Are you enrolled in our certificate program? ❑ yes ❑ no

*New Proposition 300 Policy requires that ALL new students provide **GateWay** a copy of their AZ ID or DL for in-state tuition.

***Date present stay in Arizona began** ___ / ___ / ___ (If born in Arizona and resided here continuously since birth use birthdate.) Fees are subject to an out of state/out of county tuition assessment by GateWay if:

1. You have resided in Maricopa County for less then one year. 2. You are not a legal resident.

You may still attend all classes, but an additional flat rate per credit hour may be applied.

_____ Please initial here indicating you have read and understood the GCC Out of State Tuition Policy.

Do you require reasonable accommodations: Explain _____

Please note textbooks are not included and may be purchased from the publisher or online retailer.

Course Title	Member Fees*	Non-Member Fees*	Gateway Registration Fees
_____ELC 119 Concepts of Electricity & Electronics……	$348……..	$384…….	$15
_____ELC 103 Electrical & Mechanical Math……	$348……..	$384…….	$15
_____ELC 125 Commercial Electrical Wiring and Codes……..	$348……..	$384…….	$15
_____ELC 144 Basic Automated Systems Using PLC's……	$348……..	$384…….	$15
_____ELA 210 AC Machinery/DC Machinery……	$348……..	$384…….	$15
_____ELA 30 Understanding PV Electrical Codes……..	$425……..	$485	
_____ELA 40 Electrical Grounding & Bonding……..	$270……..	$300	
_____ELA 45 Electrical Equipment and Maintenance…….	$270……..	$300	
_____ELA 70 Electrical Safety for Commercial Facilities……..	$270……..	$300	

Note:
One (1) $15.00 fee per semester
ELC course fees do not include text books

Certificate Programs	Member Fees*	Non-Member Fees*
❑ Residential Certificate Fee	$ 30	$ 30
❑ Commercial Certificate Fee	$ 30	$ 30
❑ Industrial Certificate Fee	$ 30	$ 30
❑ Technical Certificate Fee	$ 30	$ 30
	Sub Total_____	Sub Total_____

Full Fee is due at the time of registration. Also valid state ID must be presented when appropriate, or an out-of-state fee will be charged. Fee Total $_____

Do you intend to use financial aid for a portion of class payment(s)? ❑ Yes ❑ No (please check one)

❑ Check Enclosed #: _____ ❑ M/C ❑ Visa ❑ AMEX

(All credit card receipts will be sent to the email address you provide above.)

❑ Credit Card #:_____ 3 Digit Code:_____Exp Date: _____

Exact Name on Card: _____ Signature: _____

CC Billing Address if Different:_____Zip: _____

*Cancellation Policy: A full refund will be issued only if written notice of cancellation is received **seven (7) days** prior to the class start date. All registrations received by mail or fax are confirmed registrations, unless cancelled within the proper time frame. All courses are subject to cancellation if minimum enrollment requirements are not met. **No-shows:** Participants are charged the full amount if they register but do not attend. Due to the number of classes we hold each season, we do not provide confirmation. *_____ (Please initial here indicating you have read and understood the cancellation policy.)

*These areas must be read and completed for registration.

REGISTER ONLINE AT: EDU.ELAZ.ORG

Please return completed application and fees to: Electric League of Arizona, 2702 N. 3rd Street, Suite 2020, Phoenix, AZ 85004.
Email: education@elaz.org • Fax: 602-274-0029 • Phone: 602-263-0115

ELA Institute for Facility Management Education

Facility Management General Studies

The ELA Institute for Facility Management Education presents its General Studies continuing education program. The General Studies Program was developed to meet the unique training needs of facility maintenance personnel who wish to participate in continuing education on an individual course basis to refresh existing job skills or learn new skills. Students interested in more structured curricula may wish to consider the Institute's Certificate programs.

HVAC Courses

HPC 101 REFRIGERATION THEORY & SYSTEMS DIAGNOSIS

Session 1: Aug. 17 & Aug. 19, 2026 - Online
Session 2: Sept. 22 & Sept. 24, 2026 - PERA
Fees: $155 Members / $185 Non-Members
Time: 6:00 p.m. - 9:30 p.m.
Included with this class is a Super Cool Slide Rule.

What You Can Expect: This course will review mechanical refrigeration theory and system troubleshooting. The four basic components, reversing valves, superheat, sub-cooling, sensible heat, latent heat and BTU's are all reviewed. This course will focus on heat pump operation and diagnosis. If you do not have service experience and/or refrigeration training, Refrigeration Fundamentals is a recommended prerequisite.

HPC 102 CHARGING, PIPING, & DEHYDRATION

Dates: Dec. 10, 14, & 15, 2026 - PERA Club
Fees: $213 Members / $243 Non-Members
Time: 6:00 p.m. - 9:30 p.m.

What You Can Expect: Did you know factory studies of failed compressors show a large amount of compressor failures are caused by improper refrigerant levels? This is not a well-known fact in our industry. Refrigerant charge imbalances cause slow degradation of the compressor bearings, valves and motor windings. This results in compressor failures occurring some time after the charge becomes unbalanced, making the connection between refrigerant levels and malfunctions difficult. Improper piping and contaminants are also big offenders.

HPC 103 ELECTRICAL FUNDAMENTALS FOR HEAT PUMPS

Session 1: Aug. 25 & 27, 2026- Online
Session 2: Nov. 10 & 12, 2026 - PERA Club
Fees: $162 Members / $192 Non-Members
Time: 6:00 p.m. - 9:30 p.m.

What You Can Expect: This class will focus on basic electricity as it pertains to heat pump operations. Topics to be covered include basic electron theory, electromagnetism and PSC motor theory. You will understand how compressors run and start systems work. Having an understanding of capacitor and potential relay operation on an electron level can help the service technician diagnose and avoid malfunctions that are commonly overlooked.

HPC 104 CONTROL SYSTEMS FOR HEAT PUMPS

Session 1: Sept. 1 & 3, 2026 - Online
Session 2: Nov. 17 & 19, 2026 - In Person
Time: 6:00 p.m. - 9:30 p.m.
Fees: $162 Members / $192 Non-Members

What You Can Expect: Participants will attain the knowledge to design an entire electrical system for a residential heat pump. You will also learn the theory of operations and diagnostics of heat pump control circuitry including calibration and testing of common brands of thermostats, cooling and heating anticipation circuits, and commonly used electromechanical and electronic defrost systems.

HPC 106 HVAC CODE & SAFETY

Date: Sept. 8 & 10, 2026 - In Person
Fees: $299 Members / $325 Non-Members
Times: 6:00 p.m. - 8:30 p.m.
Included in this class is a copy of the current 2024 International Residential Code Book($200).

What You Can Expect: This class is designed to make you more comfortable with the International Residential Code. In this interactive class, popular code issues and interpretations will be discussed. Come prepared to discuss your personal experiences with the Code.

HPC 107 AIRFLOW DYNAMICS

Session 1: Sept. 15 & 17, 2026 - Online
Session 2: Nov. 2 & 4, 2026 - In Person
Fees: $162 Members / $192 Non-Members
Time: 6:00 p.m. - 9:30 p.m.
Included in this class: A/C Air Duct Calculator.

What You Can Expect: Airflow is one of the most critical issues for customer comfort. Many comfort complaints and improper system operation problems are a result of poor air distribution. A thorough understanding of airflow dynamics can enable you to uncover and resolve system problems. This course will help you identify inadequate or excessive airflow issues. It will help you solve hot spot, drafty, noisy and stale air complaints. Frequently airflow problems can be easily solved by a minor adjustment or changing to a better register.

NATE APPROVED TESTING FACILITY TRAINING PROVIDER

NATE CEHs available for all HPC Courses.

HPC 156 VARIABLE FREQUENCY DRIVES

Date: Sept. 29, 2026 - In Person
Time: 6:00 p.m. - 8:30 p.m.
Fees: $110 Members / $140 Non-Members

What You Can Expect: An overview of modern AC VFD design and component layout. An overview of AC Induction Motors and how they work with VFDs. How motors in variable fan and pump applications correspond to fan/pump affinity laws, how this saves energy and why VFDs are used for these purposes.

HPC 166 HVAC COMMISSIONING

Dates: Sept. 14, 2026
Fees: $145 Members / $175 Non-Members
Times: 5:30 p.m .- 9:00 p.m.
Included in this class is a copy of the ANSI/ ACCA 9 - (HVAC Quality Installation Verification Protocols).

Course will be held in-person for students, while at the same time, online to students who opt to attend remotely.

What You Can Expect: This course delves into the critical aspects of HVAC system performance, focusing on fault detection, commissioning procedures, and Quality Installation Verification Protocols (ACCA QI9). Interpretation and analysis of HVAC system documentation, such as mechanical specifications, mechanical drawings, control drawings, and test and balance reports.

HPC 167 NATE CERTIFICATION CORE SPECIALTY EXAM, TESTING SESSION

Date: November 13, 2026 - In Person
Fees $520 Members / $550 Non-Members
Times: 8:00 a.m. - 4:30 p.m.

FREE Informational Session: Online, Oct. 6, 2026 Time: 6:00 pm - 7:00 pm

What You Can Expect: This course will provide the student with a suggested study plan for the 1.5-hour Core Exam and 2.5-hour Specialty Exam for North American Technician Excellence (NATE) Certification. Topics covered include safety, tools, heat transfer, comfort, basic science, basic electrical, installation, planned maintenance, system components, and design considerations. Sample test questions will be reviewed.

The NATE Exams will be administered by the certified proctor directly after the exam overview.
Please bring a valid driver's license or state issued ID. Laptop required for exam;

HVAC Course Registration

Student Name:_____ Date:_____

Company: _____ Position: _____

***E-mail:_____

Mailing Address:_____

City:_____ State:_____ Zip: _____

Daytime Phone:_____ ***Fax #:_____

Person/Company responsible for payment: _____Contact:_____

Are you a member of the ELA? ❑ Yes ❑ No

***We may use this fax number or email address to inform you of similar educational courses.

(All credit card receipts will be sent to the email address you provide above.)

Rates	Non-Member Rate	Member Rate
❑ **HPC 101** Refrigeration Theory & Systems Diagnosis	$185	$155
❑ **HPC 102** Charging, Piping & Dehydration	$243	$213
❑ **HPC 103** Electric Fundamentals for Heat Pumps	$192	$162
❑ **HPC 104** Control Systems for Heat Pumps	$192	$162
❑ **HPC 106** HVAC Code & Safety	$329	$299
❑ **HPC 107** Airflow Dynamics	$192	$162
❑ **HPC 156** Variable Frequency Drives	$140	$110
❑ **HPC 166** HVAC Commissioning (online & in person)	$175	$145
❑ **HPC 167** NATE Overview & Exam	$550	$520

❑ *I have completed the Facility Maintenance Technician Program and want a certificate of completion for this course.

Cancellation Policy and No-Shows

A full refund will be issued as long as **written notice is received 48 hours prior** to the class starting time. Due to the number of courses held and registrations received, we do not provide written or verbal confirmation. Returned checks are subject to a $30.00 returned check fee. All registrations received by mail or fax are confirmed registrations unless cancelled within the proper time frame or unless notification of full or cancelled classes is received from the Arizona Heat Pump Council. Participants are charged the full fee amount if they register but do not attend. There are no refunds for no-shows.

** _____ Please initial here to indicate you have read, understood, and agreed to this cancellation policy.

Method of Payment Payment must be received prior to start of class.

Total: $ _____ ❑ Check enclosed #: _____ ❑ M/C ❑ Visa ❑ AMEX

Credit Card #: _____ 3 Digit Code: _____ Exp Date: _____

Exact name on card: _____ Signature: _____

Billing Address if different: _____ State:AZ Zip:_____

REGISTER ONLINE AT: EDU.ELAZ.ORG

Please mail registration and payment to: Arizona Heat Pump Council • 2702 N. 3rd Street, Suite 2020

Phoenix, AZ 85004 Or fax to: 602-274-0029 • Call 602-263-0115 for more information

Electric League of Arizona
2702 N. 3rd Street, Suite 2020
Phoenix, AZ 85004

The ELA Institute's Faculty

Mark D. Cook - Mark is an Electrical Education Specialist at Faith Technologies University and has been in the electrical trade since 1978. His present role is providing CEU classes as well as exam prep and arc flash classes. Mark spent time in the industry working in both high-voltage and low-voltage residential, commercial and industrial occupancies. He also owned his own business from 1994 until accepting a position with Faith Technologies in 2015. He was an adjunct instructor for Independent Electrical Contractors (IEC) of AZ while teaching for the Electric League of Arizona. Mark recently passed the 7-hour Washington State Administrators exam and was appointed to Code-Making-Panel #2 in April of 2020. He also writes monthly code articles for The Electric Times.

Derrick A. Denis, CIAQP, CAC, CIEC - Derrick A. Denis is an internationally recognized practitioner, inventor, educator, author, and volunteer. Since 2006 Mr. Denis has instructed at the Electric League of Arizona (ELA). Mr. Denis has provided professional industrial hygiene (IH), environmental health and safety (EH&S), infection control (IC), and indoor environmental quality H(IEQ) services domestically and abroad for over 32 years. He is a sought-after presenter and instructor, who has provided hundreds of educational sessions and classes for associations around the world. Mr. Denis has appeared as a subject matter expert on television programs, been interviewed on radio talk shows, written and headlined educational videos, been quoted in major & local newspapers, authored many industry articles.

Dave Inman - With over two decades of experience in the lighting industry, Dave Inman brings a wealth of expertise to his role as specifications and employee development manager. His primary responsibilities include design, sales support, and promoting employee growth. Dave's unique contributions, including the design of a horticultural lighting fixture, have been recognized by the industry. His active involvement in professional associations, including membership in NAILD's sustainability committee and serving on the events' committee for the Phoenix Chapter of the IES, underscores his commitment to the industry's growth and sustainability.

Mark C. Ode - Mark C. Ode retired as Lead Engineering Instructor at the Underwriters Laboratories Inc. He has written monthly NEC articles for Electrical Contractor Magazine from January 1, 2000 through present. He is the author of Cengage's 2023 Grounding and Bonding book and the Cengage's 2023 Commercial Wiring book, and co-author of the Soares 2023 Book on Grounding for the International Association of Electrical Inspectors (IAEI). He has been a principal member of NEC Panel 4, 13, and 20, and an alternate member of NEC Panel 3 and 7. He was an alternate member on the NEC Technical Correlating Committee. Prior to joining NFPA, Mr. Ode worked for over 27 years as a licensed electrician and a licensed electrical contractor. He has taught the National Electrical Code throughout the United States, Europe, and Asia. He is certified for electrical inspection, general electrical installations, and for electrical plan review by the IAEI.

Dan Turley - With 27 years' experience in the commercial and residential electrical industry and currently works as a maintenance electrician. He has over 12 years of supervisory experience, including over 8 years as a Licensed Arizona electrical contractor, and has overseen large electrical installations. He is a certified Level 1 Thermographer. One of his current projects is to perform Arc Flash Studies on various buildings in the valley and to apply NFPA 70E to promote electrical safety in the work place. His expertise is in Commercial, Residential and Industrial electrical work but he has general knowledge and understanding of plumbing, HVAC, and maintenance procedures. He has long been interested in vocational education, completing a Master of Education degree in Educational Media and Computers. He has written several computer-based training programs. He also has a Bachelor of Science in Psychology from ASU.

Kevin Styles - Kevin has over 23 years of experience in multiple areas of the HVACR industry. As service manager of Arizona's Dukes of Air, he leads a team of HVAC technicians, offers advanced technical training, and ensures personnel can deliver quality customer service. Kevin's extensive knowledge of residential air conditioning and commercial and industrial refrigeration allows him to pass on his knowledge through valuable technical training and by building on customer relation skills.

Brian Moen - Brian has been in the electrical industry for over 40 years, starting as an apprentice in 1979, working as a journeyman/foreman after the apprenticeship. He moved from the field into the office in 1992 as an estimator/project manager. Brian owned his own company for 12 years and is currently the Construction Manager at an Electrical, Instrumentation and Control company in the Phoenix area and has a staff of 5 Project Managers and Estimators. He has held his contractors/masters license in 12 states. Brian has taught off and on throughout his career, teaching control classes, code classes and all years of various apprenticeship programs.

Marc Ramirez - Marc has worked in the electrical industry for over 50 years. He owned and operated Mr. Electric Service Co., Inc. in New York focusing primarily on service, sold the company and retired in 2001. With over 40 years of business experience in service operations management, he was recruited by Hatfield-Reynolds Electric, as V.P. of Service Operations from 2001 - 2008. He has been an adjunct faculty member of Gateway Community College teaching the third year Electrical Apprenticeship Program for the IEC Arizona Chapter from 2006 till 2017 and currently instructing for the Electric League of Arizona. He served as principle member of the NFPA National Electrical Code Panel 17 from 1993 to 2014.

Ed Weiss, Power Quality Instructor - Mr. Weiss has a distinguished background in Power Quality Engineering for the past nineteen years and is a published author, seminar speaker, holds two P.Q. related patents and is currently President of Applied Power Quality Solutions. His business specializes in power quality monitoring, evaluation, and resolutions of problems affecting the operational integrity of the businesses most critical technology assets.

Amy Ferguson - Amy has been in sales for 24 years and in HVAC now for 10 years. Amy built her HVAC sales career through several means, especially through continuing education courses through the Heat Pump Council, Trane Sales, and Lennox Sales classes and by completing her NATE certification. She has been able to put into practice what she's learned and has been able to grow her career from residential to industrial HVAC and power. Amy has worked for residential and commercial companies, HVAC manufacturers, as well as Air Balance. She loves using solution-based sales techniques to solve real world problems for my customers.

Chayce Naylor - Chayce has spent his entire career in the electrical trade, beginning hands-on in the field and building a broad, practical foundation. In his youth, he worked at a family-owned business performing residential and commercial electrical work. He completed his apprenticeship at a steel manufacturing plant in Phoenix and went on to spend multiple years in commercial construction and service work before transitioning back into the industrial sector. In recent years, Chayce has focused on municipal industrial projects including water and wastewater facilities across the state of Arizona. An ELA alumnus with a degree in electrical technology, Chayce has advanced from the field through estimator and project manager roles and has spent multiple years in administrative leadership, recently as the assistant manager for an electrical contractor in Phoenix.