NFPA 70E 2024 — Electrical Safety in the Workplace

Lightwave Leaning

Online Electrical Continuing Education

4 Hours | 4 Credits

This curriculum covers the 2024 edition of NFPA 70E — Standard for Electrical Safety in the Workplace, organized across all major articles and key annexes from the standard. Each of the 50 lessons translates a specific section of the 2024 NFPA 70E into field-applicable training for electricians working on or near energized equipment. Lessons are listed in ascending code section order and are tagged by topic type to support targeted instruction in risk assessment, PPE selection, lockout/tagout, maintenance safety, and electrical safety program requirements.

ARTICLE 90 & 100 — INTRODUCTION AND DEFINED TERMS

Lesson 1 **90.1 — Purpose and Scope of the 2024 NFPA 70E Standard** [PROGRAM]

Students will learn what the 2024 NFPA 70E is designed to accomplish, what workplace electrical hazards it addresses, and which workers and work environments it governs.

Lesson 2 **90.2 — Who the Standard Applies To — Coverage and Exemptions** [PROGRAM]

Students will learn which employers, employees, and electrical work activities fall within the scope of the 2024 NFPA 70E, and which are explicitly excluded from coverage.

Lesson 3 **100 — Part I — Essential Defined Terms — Hazard Recognition** [DEFINITIONS]

Students will learn the precise 2024 NFPA 70E definitions for arc flash hazard, arc flash boundary, electrical hazard, incident energy, and other hazard-recognition terms used throughout the standard.

Lesson 4 **100 — Part II — Essential Defined Terms — Protective Measures and Status** [DEFINITIONS]

Students will learn how the 2024 NFPA 70E defines electrically safe work condition, energized, qualified person, working on vs. working near, and other terms that determine what PPE and procedures are required.

ARTICLE 105 — APPLICATION OF SAFETY-RELATED WORK PRACTICES

Lesson 5 **105.1 — Scope of Article 105 — Where Work Practices Apply** [PROGRAM]

Students will learn which types of electrical work and work locations are governed by the safety-related work practices in Article 105 and how the scope connects to the rest of the standard.

Lesson 6 **105.3 — Employer and Employee Responsibility for Electrical Safety** [PROGRAM]

Students will learn what the 2024 NFPA 70E requires of employers in establishing safety programs and what personal responsibilities electricians carry for their own protection on the job.

ARTICLE 110 — GENERAL REQUIREMENTS FOR ELECTRICAL SAFETY-RELATED WORK PRACTICES

Lesson 7 **110.1 — Electrical Safety Program — Required Elements and Documentation** [PROGRAM]

Students will learn what a compliant 2024 NFPA 70E electrical safety program must contain, including written procedures, controls, and how program elements translate to field-level compliance.

Lesson 8 **110.1(H) — Electrical Safety Program Auditing Requirements** [PROGRAM]

Students will learn when and how the 2024 NFPA 70E requires employers to audit their electrical safety program and what documentation and corrective action processes must be in place.

Lesson 9 **110.2 — Training Requirements — Qualified and Unqualified Persons** [PROGRAM]

Students will learn what training the 2024 NFPA 70E requires before an electrician can be classified as a qualified person and what that classification allows and requires in the field.

Lesson 10 **110.3 — Lockout/Tagout Program — Employer Program Requirements** [LOTO]

Students will learn what a compliant lockout/tagout program must include under the 2024 NFPA 70E, including how it coordinates with OSHA requirements and when written procedures are mandatory.

Lesson 11 **110.4 — Test Instruments, Equipment, and Safety Interlocks** [PROCEDURES]

Students will learn what the 2024 NFPA 70E requires for selecting, rating, and inspecting test instruments used near energized equipment, and why bypassing safety interlocks is prohibited.

Lesson 12 **110.5 — Portable Electric Tools and Equipment — Safety Requirements** [PROCEDURES]

Students will learn the 2024 NFPA 70E requirements for inspection, grounding, and safe use of portable electric tools and equipment on electrical work sites and in energized areas.

Lesson 13 **110.6 — Alerting Techniques — Barricades, Signage, and Attendants** [PROCEDURES]

Students will learn when the 2024 NFPA 70E requires barricades, safety signs, and safety attendants to protect workers and bystanders from electrical hazards in the work zone.

ARTICLE 120 — ESTABLISHING AN ELECTRICALLY SAFE WORK CONDITION

Lesson 14 **120.1 — What Constitutes an Electrically Safe Work Condition** [LOTO]

Students will learn the 2024 NFPA 70E definition and requirements for an electrically safe work condition, including why it is the preferred method for all work on electrical equipment.

Lesson 15 **120.2 — Lockout/Tagout — Devices, Documentation, and Procedures** [LOTO]

Students will learn what types of lockout/tagout devices the 2024 NFPA 70E permits, what written procedures must include, and how to apply them correctly before work begins.

Lesson 16 **120.2(B) — Simple vs. Complex Lockout/Tagout Procedures** [LOTO]

Students will learn how the 2024 NFPA 70E distinguishes between simple and complex lockout/tagout scenarios and what additional coordination and documentation complex procedures require.

Lesson 17 **120.3 — Temporary Protective Grounding Equipment** [LOTO]

Students will learn when the 2024 NFPA 70E requires temporary protective grounding, how grounds must be rated and installed, and the correct sequence for applying and removing them safely.

Lesson 18 **120.4 — Removal of Lockout/Tagout Devices — Proper Sequence and Authority** [LOTO]

Students will learn who has authority to remove lockout/tagout devices under the 2024 NFPA 70E, the required notification steps before removal, and what to do if the installing worker is absent.

Lesson 19 **120.5 — Sequence for Achieving an Electrically Safe Work Condition** [LOTO]

Students will learn the exact step-by-step sequence required by the 2024 NFPA 70E to establish an electrically safe work condition, including verification with an appropriately rated voltage tester.

ARTICLE 130 — WORK INVOLVING ELECTRICAL HAZARDS

Lesson 20 **130.1 — Justification for Work on or Near Energized Conductors** [ASSESSMENT]

Students will learn what the 2024 NFPA 70E requires before any work on energized equipment is authorized, including the infeasibility or increased hazard justification that must be documented.

Lesson 21 **130.2(A) — Energized Electrical Work Permit — When It Is Required** [PROCEDURES]

Students will learn exactly which energized work situations require a written energized electrical work permit under the 2024 NFPA 70E, and when the permit requirement may be waived by exception.

Lesson 22 **130.2(B) — Energized Electrical Work Permit — Required Elements** [PROCEDURES]

Students will learn every element the 2024 NFPA 70E requires on an energized electrical work permit, including hazard descriptions, PPE specifications, and the approval authority chain.

Lesson 23 **130.3 — Approach Boundaries — Limited, Restricted, and Arc Flash** [ASSESSMENT]

Students will learn how the 2024 NFPA 70E defines the limited approach boundary, restricted approach boundary, and arc flash boundary, and what each boundary requires of qualified and unqualified workers.

Lesson 24 **130.4 — Shock Risk Assessment — Purpose and Required Content** [ASSESSMENT]

Students will learn what a shock risk assessment must address under the 2024 NFPA 70E, including voltage levels, boundary distances, and what PPE determination must result from the assessment.

Lesson 25 **130.4(C) — Approach Distances to Energized Electrical Conductors** [ASSESSMENT]

Students will learn how to read and apply the 2024 NFPA 70E approach distance tables, including which distances apply at common voltages encountered in residential and commercial electrical work.

Lesson 26 **130.5 — Arc Flash Risk Assessment — Overview and Triggering Conditions** [ASSESSMENT]

Students will learn when the 2024 NFPA 70E requires an arc flash risk assessment to be performed, who is qualified to perform it, and what the two permitted methods for determining PPE are.

Lesson 27 **130.5(B) — Estimating Arc Flash Likelihood and Severity** [ASSESSMENT]

Students will learn how the 2024 NFPA 70E requires employers to estimate the likelihood of an arc flash occurrence and what factors — including maintenance condition and task type — affect the assessment.

Lesson 28 **130.5(C) — Arc Flash PPE Categories Method — Table-Based Selection** [PPE]

Students will learn how to use the PPE category method in the 2024 NFPA 70E tables to select arc-rated PPE based on equipment type and task, including the conditions that must be met to use the tables.

Lesson 29 **130.5(G) — Incident Energy Analysis Method — Engineering-Based PPE Selection** [ASSESSMENT]

Students will learn what an incident energy analysis is, when the 2024 NFPA 70E requires it instead of the PPE category tables, and how to read an incident energy analysis label to select the correct arc rating.

Lesson 30 **130.6 — Other Precautions for Personnel Activities — Safe Work Habits** [PROCEDURES]

Students will learn the 2024 NFPA 70E requirements covering safe body positioning, one-hand technique, non-conductive footwear, job briefings, and other field-level precautions for energized work.

Lesson 31 **130.7(A)–(B) — PPE — General Requirements and Hazard-Based Selection** [PPE]

Students will learn the 2024 NFPA 70E general requirements for selecting and using PPE, including how PPE selection must be driven by the results of the shock and arc flash risk assessments.

Lesson 32 **130.7(C)(1)–(13) — Arc-Rated Clothing and Body Protection Requirements** [PPE]

Students will learn what the 2024 NFPA 70E requires for arc-rated clothing layers, arc ratings, and how to build a compliant arc flash PPE system from the head, face, and body down to the hands and feet.

Lesson 33 **130.7(C)(14) — Arc Flash PPE Category Tables — Reading and Applying Table 130.7(C)(14)** [PPE]

Students will learn how to locate and read Table 130.7(C)(14) in the 2024 NFPA 70E to identify the required PPE category for common electrical tasks and understand its limitations and prerequisites.

Lesson 34 **130.7(C)(15) — PPE Category Method — Detailed Clothing and Equipment Requirements** [PPE]

Students will learn what arc-rated clothing, face shields, gloves, and footwear the 2024 NFPA 70E requires at each PPE category level, including minimum arc ratings and layering requirements.

Lesson 35 **130.7(D) — Rubber Insulating Equipment — Gloves, Sleeves, and Blankets** [PPE]

Students will learn the 2024 NFPA 70E requirements for inspecting, rating, and using rubber insulating gloves, sleeves, and protective blankets for shock protection during energized electrical work.

Lesson 36 **130.7(E) — Insulated Tools, Handles, and Test Instruments** [PPE]

Students will learn what the 2024 NFPA 70E requires for insulated tools and test instruments used near energized parts, including voltage ratings, inspection requirements, and prohibited modifications.

Lesson 37 **130.7(F) — Arc Flash PPE for the Head and Face** [PPE]

Students will learn the 2024 NFPA 70E requirements for arc-rated face shields, flash hoods, hard hats, and hearing protection used in arc flash PPE systems, including arc rating and compatibility rules.

Lesson 38 **130.8 — Other Precautions — Conductive Articles, Housekeeping, and Confined Spaces** [PROCEDURES]

Students will learn the 2024 NFPA 70E field precautions covering prohibition of conductive jewelry, safe housekeeping near energized equipment, and special requirements when working in confined electrical spaces.

ARTICLES 200–245 — SAFETY-RELATED MAINTENANCE REQUIREMENTS

Lesson 39 **205.1–205.4 — General Maintenance Requirements for Electrical Equipment** [MAINTENANCE]

Students will learn what the 2024 NFPA 70E requires of employers for maintaining electrical equipment in safe operating condition, including inspection intervals, documentation, and qualified maintenance personnel.

Lesson 40 **210.1–210.5 — Maintenance of Switchgear, Panelboards, and Disconnect Switches** [MAINTENANCE]

Students will learn the 2024 NFPA 70E maintenance requirements for substations, switchgear assemblies, panelboards, and disconnect switches, including the safety hazards that deferred maintenance creates.

Lesson 41 **215.1–215.2 — Premises Wiring Maintenance — Conductors and Raceways** [MAINTENANCE]

Students will learn what the 2024 NFPA 70E requires for maintaining premises wiring and how deteriorated insulation, missing covers, and exposed conductors increase both shock and arc flash risk.

Lesson 42 **225.1–225.3 — Maintenance of Fuses and Circuit Breakers** [MAINTENANCE]

Students will learn the 2024 NFPA 70E requirements for inspecting and maintaining fuses and circuit breakers, including why improper overcurrent device maintenance is a leading cause of elevated arc flash incident energy.

Lesson 43 **230.1–230.4 — Maintenance Requirements for Rotating Equipment** [MAINTENANCE]

Students will learn what the 2024 NFPA 70E requires for maintaining motors, generators, and other rotating electrical equipment to prevent shock, arc flash, and mechanical hazards during service and inspection.

Lesson 44 **235.1–235.4 — Battery and Battery Room Maintenance Requirements** [MAINTENANCE]

Students will learn the 2024 NFPA 70E maintenance requirements for battery systems and battery rooms, including ventilation, spill containment, and the electrical and chemical hazards present during maintenance tasks.

Lesson 45 **240.1–240.4 — Maintenance of Portable Electric Tools and Equipment** [MAINTENANCE]

Students will learn the 2024 NFPA 70E requirements for inspecting and maintaining portable electric tools prior to use, including grounding, insulation integrity, and when damaged equipment must be removed from service.

ARTICLES 300–350 — SAFETY REQUIREMENTS FOR SPECIAL EQUIPMENT

Lesson 46 **310.1–310.9 — Safety Work Practices for Electrolytic Cells** [SPECIAL]

Students will learn the unique electrical hazards and 2024 NFPA 70E safety requirements specific to electrolytic cell equipment, including why standard PPE and LOTO methods may require modification in these environments.

Lesson 47 **320.1–320.5 — Battery Installation and Room Safety Requirements** [SPECIAL]

Students will learn the 2024 NFPA 70E safety requirements for working on battery installations, including arc flash hazards at DC voltages, hydrogen gas explosion risk, and PPE requirements unique to battery work.

Lesson 48 **340.1–340.6 — Power Electronic Equipment — Stored Energy and Shock Hazards** [SPECIAL]

Students will learn the 2024 NFPA 70E safety requirements for working on power electronic equipment including drives and UPS systems, and why stored capacitor energy requires special wait times before work begins.

ANNEXES — SUPPLEMENTAL GUIDANCE AND REFERENCE TOOLS

Lesson 49 **Annex C — Limits of Approach — Reference Tables and Application** [ASSESSMENT]

Students will learn how to use the approach limit reference tables in Annex C of the 2024 NFPA 70E to determine safe working distances from exposed energized conductors at common commercial and industrial voltages.

Lesson 50 **Annex D — Arc Flash Incident Energy Calculation Methods** [ASSESSMENT]

Students will learn what Annex D of the 2024 NFPA 70E provides for calculating incident energy and arc flash boundaries, and how to interpret the results of an engineering calculation as they appear on equipment labels.

Lesson 51 **Annex E — Electrical Safety Program — Structure and Sample Elements** [PROGRAM]

Students will learn how Annex E of the 2024 NFPA 70E guides employers in structuring a complete electrical safety program, including the policy, procedure, and training elements that field workers should expect from their employer.

Lesson 52 **Annex F — Hazard/Risk Evaluation Procedure — Workplace Application** [ASSESSMENT]

Students will learn how to apply the hazard and risk evaluation procedure in Annex F of the 2024 NFPA 70E to systematically identify electrical hazards and select appropriate protective measures before beginning work.

Lesson 53 **Annex I — Job Briefing and Planning Checklist — Field Use** [PROCEDURES]

Students will learn how to use the job briefing and planning checklist in Annex I of the 2024 NFPA 70E as a field tool before every energized work task, covering hazard identification, PPE verification, and rescue planning.

Lesson 54 **Annex Q — Human Performance and Workplace Electrical Safety** [PROGRAM]

Students will learn how Annex Q of the 2024 NFPA 70E addresses human error factors in electrical incidents, and how attention, fatigue, task complexity, and non-routine conditions contribute to workplace electrical injuries.
