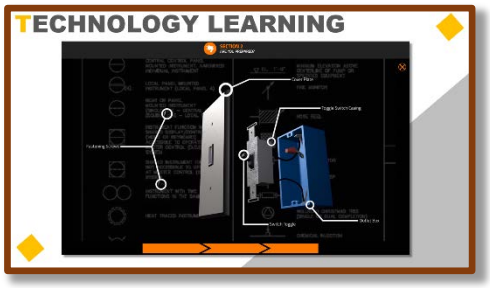
electrical training ALLIANCE
IBEW - NECA

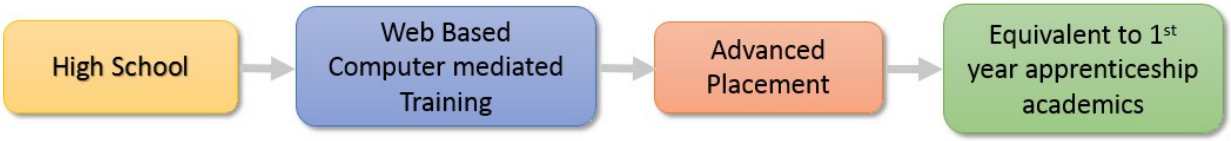
INTERIM CREDENTIALS

Advanced placement into over 274 nation-wide IBEW/NECA Electrical Training Centers.



The ***Electrical Training ALLIANCE*** **Interim Credentials** allows high school or post-secondary students to achieve all the required courses (Orientation, DC Theory, Job Information, Blueprints, and Electrical Code/Safety) for advanced placement into the 2nd year of over 274 Nation-wide IBEW/NECA Electrical Apprenticeship Training programs. The student can complete a 5-year highly technical electrical apprenticeship within four years to Journeyman Electrician status. Journeyman Electricians are employable in a wide variety of electrical occupations such as commercial, hospital, industrial, institutional, and high technology careers.

The ***Electrical Training ALLIANCE*** **Interim Credentials** curriculum is delivered utilizing the latest in computer-mediated instructions through an online Learning Management System (LMS). The content is sequenced in bite-size learning that utilizes animations, gaming, virtual and augmented activities, interactive videos, and many other visual communications. The courses can be self-regulated or blended in a classroom setting with an instructor. When used as a credited high school program, the administrator and instructors has full control over every aspect of the course delivery, including a vast amount of reporting options and the ability to export final results.



The ***Electrical Training ALLIANCE*** **Interim Credentials** curriculum is the result of over 75 years of curriculum development and work experience of the IBEW/NECA Electrical Industry. The vast experiences of over 4000 instructors through 285 electrical training centers has provided the expertise to train over 40,000 electrical apprentices each year, resulting with the knowledge and skills to successfully work in a lifetime of rewarding electrical careers.

The ***Electrical Training ALLIANCE*** **Interim Credentials** program is a head start into one of the most successful electrical apprenticeship in North America! But it also provides a solid electrical background to enter into a technical college electrical program. One of the main advantages of the curriculum is the student becomes familiar with various electrical occupations and has the basic understanding to choosing the next step of training for an electrical career.

Interim Credentials – Orientation Syllabus

Description

This course will introduce the student to the overall goal of proceeding courses as well as the expectations of the student as they progress as an apprentice electrician. The course is broken down into four individual lessons.

Expectations and Goals

Each student is expected to complete each e-learning lesson that is present on the Learning Management System (LMS). Within each lesson, students will be expected to view videos and take part in exercises and assessments to test their knowledge and mastery of the content.

Course Materials

This is an online, asynchronous course. All materials will be provided through the Learning Management System (LMS) after logging in with the provided credentials. Access to all materials is depended upon an active internet connection and internet browser to include Internet Explorer, Google Chrome, Mozilla Firefox, and Safari.

Grading

Student will be given summative assessments throughout the four lessons. These assessments will aggregate into one final grade for the course to show mastery of the content.

Course Schedule

Lesson	Topic	Exercises
1	Introduction	Knowledge Check
2	Apprenticeship	Knowledge Check
3	Responsibilities	Knowledge Check
4	Safety	Knowledge Check

Interim Credentials – Job Information

Description

This course is designed to present students with information and simulations that take place on the job site as an apprentice. This includes the introduction to the tools of that an electrician will use on a daily basis, workplace basics, and the various materials that they will come in contact with.

Expectations and Goals

Each student is expected to complete each e-learning lesson that is present on the Learning Management System (LMS). Within each lesson, students will be expected to view videos and take part in exercises and assessments to test their knowledge and mastery of the content.

Course Materials

This is an online, asynchronous course. All materials will be provided through the Learning Management System (LMS) after logging in with the provided credentials. Access to all materials is depended upon an active internet connection and internet browser to include Internet Explorer, Google Chrome, Mozilla Firefox, and Safari.

Grading

Students will be given formative assessments throughout the twelve lessons. These are not graded and will not aggregate into the final score for the course. A final summative assessment in the form of a remediation game will be taken at the end of each lesson. The score for each question will be aggregated into the final overall score for the course. All remediation questions start out with three available points. Each student will have multiple attempts on each question. For every incorrect response, remediation is given with another attempt. For each subsequent attempt, one point is deducted from the maximum score that each student can receive on that question.

Course Schedule

Lesson	Topic	Objectives	Assessments
1	Introduction	Identify the basic objectives of Job Information	N/A
2	Absenteeism	Recognize the significance of absenteeism, productivity, and marketplace conditions to your success in the electrical industry Recognize how your attitudes and actions related to absenteeism, productivity, and	Knowledge Checks Remediation Game

Lesson	Topic	Objectives	Assessments
		marketplace conditions may affect your career and the success of your employing organization	
3	Workplace of an Electrical Worker	Identify the apprentice role in working with journeymen Recognize the apprentice role in maintaining a clean, neat workplace Identify safe work practices related to trash, debris, tools, and materials Recognize the significance of maintaining a clean, neat personal appearance Identify appropriate ways to dress and behave on the worksite Recognize basic types of PPE used by an electrical worker	Knowledge Checks Remediation Game
4	Tools of the Trade	Identify hand and power tools used in the electrical industry Recall uses for hand and power tools used in the electrical industry Recall guidelines for safe tool usage Recall guidelines for tool maintenance	Knowledge Checks Remediation Game
5	Use and Care for Ladders	Identify safe methods and work practices for using ladders Identify unsafe conditions and unsafe usage of ladders Identify and describe proper maintenance of a ladder	Knowledge Checks Remediation Game
6	Masonry and Fasteners	Recall the basic characteristics, binding methods, and body styles of masonry fasteners Identify the three types of masonry surfaces relevant to the work of an electrical worker and the factors needed to be considered when choosing the correct fastener Recognize load, environmental and specification considerations related to holding value and selecting the best anchor for an application	Knowledge Check Remediation Game

Lesson	Topic	Objectives	Assessments
		Recall the two rules pertaining to the spacing of an anchor	
7	Twist On Connectors	Identify the purpose and use of twist-on wire connectors Recognize various types, colors, and styles of twist-on wire connectors Recall rules and considerations for selecting the proper twist-on wire connector for a particular application Recall the installation process for twist-on wire connectors	Knowledge Checks Remediation Game
8	Commonly Used Items	Recognize materials that are commonly used to construct electrical installations	Knowledge Checks Remediation Game
9	Sizing and Building Wires	Analyze the National Electrical Code (NEC) to determine wire size based on the mil area of a single strand of a conductor Determine the current carrying capacity of a conductor based on the NEC, Article 310 Identify conductor insulation properties based on temperature-ambient or from the current producing heat in the conductor	Knowledge Checks Remediation Game
10	Aluminum Conductors	Identify characteristics of aluminum wiring Learn to connect, terminate, and splice aluminum wiring and conductors Recognize effects of bending aluminum conductors Identify rules and resources related to bending aluminum conductors Identify tools, resources, and equipment for the proper installation of aluminum conductors	Knowledge Checks Remediation Game
11	Metric System	Demonstrate an understanding of the metric system Explain the advantages of the metric system Explain the value of the metric prefixes	Knowledge Checks Remediation Game

Lesson	Topic	Objectives	Assessments
		Complete accurate calculations between the English and metric systems, between prefixes, and between prefixes and whole numbers Use powers of 10 to quickly perform basic mathematical functions	
12	Alignment and Measure	Identify basic layout and measurement applications Identify traditional alignment and measurement tools Identify laser tools and their uses, safety, and care	Knowledge Checks Remediation Game

Interim Credentials – Codes and Safety Syllabus

Description

This course is focused on introducing students to the National Electrical Code (NEC) and the proper safety techniques and practices of an electrician. This course includes six e-learning, asynchronous lessons that are outlined in further detail below.

Expectations and Goals

Each student is expected to complete each e-learning lesson that is present on the Learning Management System (LMS). Within each lesson, students will be expected to view videos and take part in exercises and assessments to test their knowledge and mastery of the content.

Course Materials

This is an online, asynchronous course. All materials will be provided through the Learning Management System (LMS) after logging in with the provided credentials. Access to all materials is depended upon an active internet connection and internet browser to include Internet Explorer, Google Chrome, Mozilla Firefox, and Safari.

Grading

Student will be given formative assessments throughout the six lessons. These are not graded and will not aggregate into the final score for the course. A final summative assessment in the form of a remediation game will be taken at the end of each lesson. The score for each question will be aggregated into the final overall score for the course. All remediation questions start out with three available points. Each student will have multiple attempts on each question. For every incorrect response, remediation is given with another attempt. For each subsequent attempt, one point is deducted from the maximum score that each student can receive on that question.

Course Schedule

Lesson	Topic	Objectives	Exercises
1	Safety	Define the purpose and intent of the code Demonstrate a working knowledge of the NEC, including its applications Apply Article 100 to locate definitions contained in Article 100	Knowledge Checks Remediation Game

Lesson	Topic	Objectives	Exercises
		Identify several potential problems which might lead to electrical shock Describe the operation of GFCI List an employer's responsibility in providing safe electrical equipment on the job Describe OSHA requirements regarding Ground-Fault Circuit Interrupters and the "Assured Equipment Grounding Conductor Program Explain the potential dangers of falling objects Understand some basic rules to set-up and use a scaffold in a safe manner Identify and list scaffold safety rules	
2	Introduction to the NEC	Explain the purpose and intent of the Code Determine the scope of the Code as to where it does or does not apply Demonstrate a working knowledge of the NEC, including its application	Knowledge Check Remediation Game
3	Interpreting of the Language of the NEC	Apply Article 100 to locate definitions contained in Article 100 Recognize that a term must be listed in more than one article to appear in Article 100 Recognize that a term appears in the .2 section of an article when the definition is only used in that article	Knowledge Check Remediation Game
4	Understanding and Applying Article 110 of NEC	Identify where terms that are used in only one article are defined Describe how terms in the second section of an article are applied	Knowledge Check Remediation Game
5	Wire and Insulation Properties	Identify materials recognized by the Code for use as electrical conductors Compare the ability of different metals to conduct electricity Identify some of the on-the-job applications of Code regulations pertaining to electrical conductors Describe why some materials are better conductors or insulators than other	

Lesson	Topic	Objectives	Exercises
		Identify materials more commonly used as conductors or insulators Use letter symbols to identify various types of insulation used on wires Identify materials recognized by the Code for use as conductor insulation Discuss the effect heat has on insulation and the temperature ratings of conductors	
6	Introduction to Wiring Devices	Identify the different components of a wiring device Be familiar with the general requirements to installing wiring devices Be familiar with the best practices for installing wiring devices	Knowledge Check Remediation Game

Interim Credentials – DC Theory Syllabus

Description

This course will introduce students to intricacies of DC Theory. Students will learn the fundamentals of circuits, wiring, and the mathematical ways in which an electrician works on a daily basis that includes the relationship between voltage, current, and resistance. This course is a simulation based e-learning that has the students actively trying to bring a starship's engines back online. The course is broken down into eight individual missions.

Expectations and Goals

Each student is expected to complete each e-learning mission that is present on the Learning Management System (LMS). Within each mission, students will be expected to view videos and take part in exercises and assessments to test their knowledge and mastery of the content.

Course Materials

This is an online, asynchronous course. All materials will be provided through the Learning Management System (LMS) after logging in with the provided credentials. Access to all materials is depended upon an active internet connection and internet browser to include the latest version of Firefox, Google Chrome and Google Chromebooks (2006 or newer).

While in the lessons, navigation is done through by selecting the arrows at the right or left of each screen. The lessons, and course, are complete when the student has gone through each part of the lesson and all activities and games are completed. Should the student log out of the lesson, course progression will be saved for their next log on.

Grading

Student will be given formative assessments throughout the eight missions. These are not graded and will not aggregate into the final score for the course. A final summative assessment in the form of a challenge will be taken at the end of each mission. The score for each question will be aggregated into the final overall score for the course. All remediation questions start out with three available points. Each student will have multiple attempts on each question. For every incorrect response, remediation is given with another attempt.

Mastery of this course is defined through the completion of all of the learning activities in each lesson as well as completion and passing scores on the remediation games. Each activity or question is aligned to a specific objective.

Course Schedule

Mission	Topic	Objectives	Assessments
1	Electrical Basics	Identify the fundamentals of electricity Define atomic theory Describe the relationship between positive and negative charges	Knowledge Checks Challenges
2	Series Circuits	Describe a series DC circuit Identify which specific component of a circuit is being represented by a specific symbol on a schematic drawing Draw the correct symbol for electrical or electronic components when make schematic drawings Describe the type and construction of various standard resistors, including the resistance value, wattage rating, and tolerance Determine a resistor value and tolerance by using its color bands Calculate total resistance in a series circuit Describe how the total current works in a series circuit Calculate component voltage in a series circuit Determine wattage loads and total watts of a series circuit	Knowledge Checks Challenges
3	Parallel Circuits	Describe the branching and reconnecting of alternate current paths in parallel circuits Calculate total resistance of a variety of resistance values in parallel Determine circuit voltage and branch voltages in parallel circuits Calculate the currents in the individual branches of parallel circuits Determine the total current in parallel circuits by determining the equivalent resistance of the circuit and solving for current	Knowledge Checks Challenges

Mission	Topic	Objectives	Assessments
		Determine total current by finding the current in each branch and then solving for total current Use Watt's laws to determine branch wattage and total circuit power in parallel circuits	
4	Combination Circuits	Identify alternative current paths in a combination or series-parallel circuits Determine which components are in a series and which are in parallel in combination circuits Apply series or parallel rules to determine the current through any branch or component of a combination circuit Reduce any combination circuit to an equivalent resistor Find voltage values for different parts of a combination circuit Determine each circuit component's current, ohrmic, voltage, and power values Work with circuit components to find unknown component values elsewhere in the circuit Calculate circuit total current resistance, voltage, and power values	Knowledge Checks Challenges
5	DC Circuit Analysis	State the law of proportion for series circuits Describe the voltage dividers in series circuits Explain the difference between directly proportional and inversely proportional relationships State the Law of Proportionality as it applies to series and parallel circuits Solve problems involving resistors in parallel, using the Law of Proportionality Apply Kirchoff's Laws to solve for circuit variables in complex circuits State the steps necessary to apply the Principle of Superstition	Knowledge Checks Challenges

Mission	Topic	Objectives	Assessments
		Apply the theory of superposition to solve for multiple voltage source circuits Explain Thevenin's and Norton's Theorems Apply Thevenin's and Norton's Theorems to solve for circuit unknowns	
6	Circuit Theory and Switches	Identify the relationship between wires and conductors Describe circuit concepts of open, closed, and short circuits Determine the current flow scenarios for open, closed, and short circuits Describe switch patterns in schematic form Recognize switch ratings Troubleshoot basic switch problems Explore material effects and variations of resistance on conductors Determine the conductor gauge Determine circular mil and square mil cross-sectional area of conductors Analyze incandescent lamps as loads	Knowledge Check Challenges
7	Magnetism and Electromagnetism	Identify and define key terms: the terms, laws and theories of magnetism Identify and define key terms: magnetic field, electromagnet, generator and electrical polarity Determine polarity of magnetic poles Analyze the effects of magnetic fields on producing electricity	Knowledge Check Challenges
8	Generators and Motors	Explain the basic principles involved in generating DC power Describe the basic construction and operation of simple DC generators Demonstrate the Left-Hand Rule for Generators to show relative motion, magnetic flux, and electron flow	Knowledge Check Challenges

Mission	Topic	Objectives	Assessments
		Describe the variable that determine the level of voltage output by a generator	
		Identify the components of a DC machine	
		Explain how a DC motor turns and can determine the direction of motion	

Interim Credentials – Blueprints Syllabus

Description

This course is focused on introducing students to the process of reading, measuring, and interpreting blueprints. While on the jobsite, students will be expected to be able to understand exactly what is in front of them and be able to interpret drawings and schematics.

Expectations and Goals

Each student is expected to complete each e-learning lesson that is present on the Learning Management System (LMS). Within each lesson, students will be expected to view videos and take part in exercises and assessments to test their knowledge and mastery of the content.

Course Materials

This is an online, asynchronous course. All materials will be provided through the Learning Management System (LMS) after logging in with the provided credentials. Access to all materials is dependent upon an active internet connection and internet browser to include Internet Explorer, Google Chrome, Mozilla Firefox, and Safari.

While in the lessons, selecting the arrows at left and right. The lessons, and course, are complete when the student has gone through each part of the lesson and all activities and games are completed. Should the student log out of the lesson, course progression will be saved for their next log on.

Grading

Student will be given formative assessments throughout the seven lessons. A final summative assessment will be given within the LMS that is administered and proctored by a member of the Electrical Training Alliance. The score for each question will be aggregated into the final overall score for the course.

Mastery of this course is defined through the completion of all of the learning activities in each lesson as well as completion and passing scores the assessments. Each activity or question is aligned to a specific objective.

Course Schedule

Lesson	Topic	Objectives	Exercises
1	Evolution of the Blueprint Draft	Identify the role of a Blueprint	NA
2	Projections and Perspectives	Identify the different types of projections used in blueprint drawings Recognize and label the views on orthographic, isometric, and oblique drawings Explain the steps used in creating orthographic, isometric, and oblique drawings	Knowledge Check
3a	Related Math	Convert feet to inches and inches to feet Add and subtract feet and inches Calculate area Calculate volume	Knowledge Check
3b	Scaling and Dimension	Describe the need for scale and its uses Recognize and select the proper scale for the appropriate task Scale a drawing accurately Differentiate between extension lines and dimension lines Identify the rules and concepts of print dimensioning	Knowledge Check
4	Architectural Considerations	Identify the function of plans, elevations, sections, details, schedules, and specifications Explain the impact that addenda and revisions have on the construction process Locate the information found on a title block Describe the division of prints by discipline	Knowledge Check
5	Schedules and Specs	Identify the information found on various schedules Identify the information found in specification Determine what schedules to use for specific situations Determine when to use specifications	Knowledge Check

Lesson	Topic	Objectives	Exercises
6	Residential Print Reading	Explain the process of studying a residential print Identify the various prints used on a residential project Utilize plans and elevations to determine device placement and electrical service location Visualize a residence by looking at a set of residential construction drawings	Knowledge Check Remediation Game