



Independent Electrical Contractors, Inc.  
Arlington, Virginia

Course Review Report  
September 30, 2021

Review Date: September 20 – 24, 2021  
Review ID: 13067  
Courses: 4  
VIRTUAL

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**APPROVAL LETTER**

September 30, 2021

Paul Dolenc  
Independent Electrical Contractors Inc.  
2900 S Quincy St, Ste. 720  
Arlington, VA 22206

Mr. Dolenc,

Congratulations on your recent ACE Learning Evaluations review. The review results are ready to be displayed in the ACE National Guide to College Credit for Workforce Training at [www.acenet.edu/nationalguide](http://www.acenet.edu/nationalguide).

Please proofread to ensure that the organization description contained in the enclosed Final Review Report is correct. Reviewer notes are not published to the National Guide. If corrections are needed, please make corrections directly on the Final Report and forward them to me via email.

Your signature below authorizes the publication of the course(s) to the ACE National Guide to College Credit for Workforce Training at [www.acenet.edu/nationalguide](http://www.acenet.edu/nationalguide) and the use of your organization logo and references to your organization on ACE newsletters, webpages and social media sites.

All final review payments are due within 30 days of receipt of invoice. If timely payment is not remitted, courses may be removed from the National Guide to College Credit for Workforce Training until payment is received.

We look forward to receiving your signed approval no later than October 30, 2021 via email.

\_\_\_\_\_  
Contact's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Contact's Title

\_\_\_\_\_  
Telephone

Sincerely,

Richard Roman  
Senior Program Manager, Learning Evaluations  
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## **Independent Electrical Contractors, Inc.**

**Organization Description:** The Independent Electrical Contractors, Inc. (IEC), headquartered in Arlington, Virginia, is a national trade association. Established in 1957, IEC represents nearly 3,000 electrical and systems contracting companies from across the United States. IEC exists to promote the success of all electrical contractors through communications, training, and guidance. To accomplish this, IEC provides its membership with education and training for contractors, workers, potential workers, and the general public.

IEC has been training apprentices since 1972 and first received recognition from the Department of Labor's Bureau of Apprenticeship and Training (now Office of Apprenticeship). The introduction in the early 1990s of a standardized, high-quality apprenticeship program made a significant impact on the electrical industry. Starting with an enrollment in 1994 of approximately 2,000 students. In 2021, IEC's enrollment was near 14,000 apprentices across the 50 plus chapters nationwide. The apprenticeship program is a formalized system of education combining on-the-job training and classroom instruction as defined by the U.S. Code of Federal Regulations. IEC's apprenticeship curriculum is designed to guide the classroom portion of the training for someone studying to be an electrician. The classroom portion consists of a minimum of 144 hours per year with lectures, demonstrations, labs and homework, and comprehensive examinations. Apprentices also receive a minimum of 2,000 hours per year of on-the-job training. IEC established the program's standards and administrative guidelines in cooperation with the Office of Apprenticeship. The IEC apprenticeship curriculum is divided into four one-year courses. Development of the curriculum and the responsibility for quality control resides with the IEC National Apprenticeship and Training Committee, which receives support from the IEC Training and Education Department and the IEC National Board of Directors. Local Chapter Apprenticeship and Training Committees provide local compliance with IEC National and Office of Apprenticeship standards and guidelines.

<http://www.ieci.org>

## **First Year Electrical Apprenticeship Program**

**ACE Transcript Data:** IECI-0001

**Location:** Version 7: Hybrid.

**Length:** Version 7: 36 weeks (144 hours)

**Dates:** Version 7: 09/01/2021 - 08/31/2024

**Objective:** Version 7: The course objective is to provide the student with instruction in practical aspects of electrical theory, introduction to National Electrical Code, basic wiring methods, elementary blueprint reading, instruction in use of tools, and conduit bending. Instruction will include consistent reminders of safe jobsite practices.

**Learning Outcomes:** Version 7: Upon completion of the course, the student will be able to explain and apply basic safety and first aid measures; apply the principles of basic electricity; explain and use safe techniques in working with electricity; utilize technical mathematics in computing various electrical functions; explain and develop different types of residential electrical circuits; install branch and feeder circuits; install various types of electrical outlets; use the tools and materials associated with the level of expertise; and use the National electrical code book as a reference to find relevant Code citations.

**Instruction:** Version 7: Methods of instruction include audiovisual materials, classroom exercises, computer-based training, discussion, laboratory, learner presentations, lecture, and practical exercises. General course topics include hand tools; safety and first aid; technical mathematics; basic electrical theory; National Electrical Code; blueprint reading; electrical wiring methods; branch and feeder circuits; lighting and receptacle outlets; basic concepts of circuit protection; basic concepts of lighting; and conduit bending, knots, and basic rigging.

**Methods of Assessment:** Version 7: Methods of assessment include multiple-choice exams, papers, presentations, quizzes, and rubrics with a minimum passing score of 70 percent.

**Credit Recommendation:** Version 7: In the lower-division baccalaureate/associate degree category, 3 semester hours in DC circuits; 3 semester hours in applied mathematics; 2 semester hours in residential wiring I; 1 semester hour in electrical safety; 1 semester hour in career and workforce planning. This course is recommended for a total of 10 semester hours in the lower-division baccalaureate/associate degree category (9/21).

**Reviewer Note:** The review team has determined that the scope, content, rigor, and assessments appropriately aligned with ten semester hours in lower division across several topics: D.C. circuits; applied mathematics; electrical safety; career and workforce planning, and residential wiring. The assessments match the stated course objectives and are appropriate metrics against which the learners may demonstrate their performance mastery in the specific subject areas. In particular, materials from the course LMS are well-designed to support the learning activities. The review team has recommended course credit in the applied mathematics subject area since the skills the learner must demonstrate here align closely with such courses at the post-secondary level (9/21).

## **Second Year Electrical Apprenticeship Program**

**ACE Transcript Data:** IECI-0002

**Location:** Version 7: Hybrid.

**Length:** Version 7: 36 weeks (144 hours)

**Dates:** Version 7: 09/01/2021 - 08/31/2024

**Objective:** Version 7: The course objective is to provide the student with fundamentals of AC circuit theory; AC/DC motors, generators, and alternators; industrial and commercial wiring; and continued jobsite safety practices.

**Learning Outcomes:** Version 7: Upon completion of the course, the student will be able to expand their understanding on theory, including services and calculation; gain a basic exposure to grounding and bonding; identify different transformers and motors; and better utilization of the National Electric Code (NEC) code book.

**Instruction:** Version 7: Methods of instruction include audiovisual materials, classroom exercises, computer-based training, discussion, laboratory, learner presentations, lecture, and practical exercises. General course topics include electrical measuring instruments; AC electricity and circuits; series, parallel circuits, and three-phase circuits; resistive, inductive, capacitive series, and parallel circuits; transformers; generators; motors; alternators; National Electrical Code; industrial and commercial wiring systems; service and feeder calculations; grounding, bonding, and over current protection; and hazardous locations.

**Methods of Assessment:** Version 7: Methods of assessment include multiple-choice exams, papers, presentations, quizzes, and rubrics with a minimum passing score of 70 percent.

**Credit Recommendation:** Version 7: In the lower-division baccalaureate/associate degree category, 3 semester hours in AC circuits; 3 semester hours in transformers; 3 semester hours in electrical motor theory; 2 semester hours in commercial wiring I; 2 semester hours in residential wiring II; 1 semester hour in electrical safety. This course is recommended for a total of 14 semester hours in the lower-division baccalaureate/associate degree category. (9/21).

**Reviewer Note:** The review team determined that the scope, content, rigor, and assessments appropriately aligned with 14 semester hours in lower division across several content areas: commercial wiring I; residential wiring II; AC circuits; transformers; electrical motor theory, and electrical safety. The course modules are well-designed with quality instructional material, which are illustrated appropriately and align with the assessment materials themselves. The course LMS is also well-constructed and accurately supports the activities of the learner throughout the course. The course provides the depth of coverage and breadth of subject areas to achieve the stated learning outcomes (9/21).

## **Third Year Electrical Apprenticeship Program**

**ACE Transcript Data:** IECI-0003

**Location:** Version 7: Hybrid.

**Length:** Version 7: 36 weeks (144 hours)

**Dates:** Version 7: 09/01/2021 - 08/31/2024

**Objective:** Version 7: The course objective is to interpret blueprints and construction drawings and properly install electrical wiring for single phase and three phase motors and their controls as well as jobsite safety practices.

**Learning Outcomes:** Version 7: Upon completion of the course, the student will be able to display a deeper understanding on grounding and bonding; gain greater exposure on print reading and project planning; complete the first installment of motor controls; and conduct and perform different hands-on labs.

**Instruction:** Version 7: Methods of instruction include audiovisual materials, classroom exercises, computer-based training, discussion, laboratory, learner presentations, lecture, and practical exercises. General course topics include construction drawings; grounding of electrical equipment; motor controls; application and installation of motor control devices; logic and line diagrams; hazardous locations; signs and sign connections; and fiber optics.

**Methods of Assessment:** Version 7: Methods of assessment include multiple-choice exams, presentations, and quizzes with a minimum passing score of 70 percent.

**Credit Recommendation:** Version 7: In the lower-division baccalaureate/associate degree category, 3 semester hours in grounding & bonding; 3 semester hours in print reading; 2 semester hours in motor controllers I; 1 semester hour in electrical safety. This course is recommended for a total of 9 semester hours in the lower-division baccalaureate/associate degree category. (9/21).

**Reviewer Note:** The review team determined that the scope, content, rigor, and assessments appropriately aligned with nine semester hours in lower division across several course subject areas: motor controllers I; grounding and bonding; print reading, and electrical safety. The assessments match the course objectives and are well-designed. The course could benefit from including recommendations for commonly used course names that are used at the post-secondary level. Such courses include, but are not limited to, the following examples: (1) Electrical Technology | Calhoun Community College; (2) Electrical Technology Courses | Highland Community College | My HCC (highlandcc.edu); and (3) Program: Electrical Technology - Residential Wiring Certificate (RESWC) - Mohave Community College - Acalog ACMS (9/21).

## Fourth Year Electrical Apprenticeship Program

**ACE Transcript Data:** IECI-0004

**Location:** Version 6: Hybrid.

**Length:** Version 6: 36 weeks (144 hours)

**Dates:** Version 6: 09/01/2021 - 08/31/2024

**Objective:** Version 6: The course objective is to provide the student with trouble-shooting skills for solid state, photoelectric, electro-mechanical electronic control devices, lighting protection, grounding and design, load calculations, and leadership. The student will also review and complete appropriate jobsite safety training modules.

**Learning Outcomes:** Version 6: Upon completion of the course, the student will be able to master their understanding of motor controls; navigate through the NEC Electrical Code book; and perform different hands-on labs.

**Instruction:** Version 6: Methods of instruction include audiovisual materials, classroom exercises, computer-based training, discussion, laboratory, learner presentations, lecture, and practical exercises. General course topics include electrical safety; solid state, photoelectric, electro-mechanical, proximity, and programmable electronic control devices; AC reduced voltage starters; preventative maintenance and troubleshooting; fire alarms systems and fire protection signaling systems; NEC and safety standards and regulations; services, switchboards, and panelboards; conductors and over current protection devices; lighting protection and grounding; designing and installing wiring systems; troubleshooting circuits, outlets, motors, motor compressors, and transformers; hazardous locations; load calculations; and leadership.

**Methods of Assessment:** Version 6: Methods of assessment include multiple-choice exams, papers, performance tests, presentations, and quizzes with a minimum passing score of 70 percent.

**Credit Recommendation:** Version 6: In the lower-division baccalaureate/associate degree category, 3 semester hours in National Electric Codes (NEC); 3 semester hours in Introduction to Programmable Logic Controllers (PLCs); 3 semester hours in electrical troubleshooting; 2 semester hours in commercial wiring I; 1 semester hour in motor controllers I; 1 semester hour in electrical safety. This course is recommended for a total of 13 semester hours in the lower-division baccalaureate/associate degree category. (9/21).

**Reviewer Note:** The course covers materials in depth while also expanding the breadth of coverage in subjects such as relays, timers and sensors, and special commercial and residential applications at lower division level. The student studies the theory, practice, and National Electrical Code requirements for commercial wiring. The course consists of definitions, formulas, wiring methods, overcurrent protection, calculation and sample examinations. Wiring projects are assigned to put the theories learned in years 1-3 into practice. The course design is well-constructed and the LMS is easily navigable and user-friendly. The course could benefit from improving the assessments by utilizing the workbook exercises in the LMS as weighted parts of the learner's final course grade. The course syllabus mentions the course exams, but the review team found nothing about the LMS assignments detailed on the syllabus itself. The National Electrical Code (NEC) credit is recommended here to capture the learner's non-wiring NEC code knowledge gained throughout apprenticeship but was not captured in the previous courses. For example, students learn to do residential (year 1) and commercial electrical load calculations (year 4). These calculations were not captured in the previous courses of the apprenticeship program (9/21).