

Course Code: ECJ 116

Course Title: IBEW Electrical Construction Journeyman VI

Department: Applied Sciences and Technologies

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 46.0302

Repeatability: 0

Credit Hours

Catalog Notation: 3-2-4

Credit Hour Distribution:

Lecture: 3

Lab: 2

Clinical: 0

Total: 4

General Course Information

Catalog Description

Part of IBEW Apprenticeship Program: National Electrical Code (NEC) Article 250, electrical theory to grounding, grounding conductors, service grounding, earth testing, WYE and Delta 3-phase transformers, and load calculations.

General Course Objectives

Gain experience and knowledge regarding National Electrical Code (NEC) Article 250, electrical theory to grounding, grounding conductors, service grounding, earth testing, WYE and Delta three-phase transformers, and load calculations.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in ECJ 115

Methods of Evaluation

The minimum evaluation tools to be used are: 4 written tests, 4 quizzes, 25 homework lessons, attendance at 18 class sessions, and 4 lab exercises.

Instructional Materials and Additional Supplies

Cables and Wiring, 2nd Edition, by John Cadick 9780766802704

Delmar's Standard Textbook of Electricity, 6th Edition, Stephen L. Herman 9781285852706

Electrician's Guide To Conduit Bending, 3rd Edition, Richard Cox

Blueprint Reading Textbook, NJATC

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.
- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
NEC Code Book, Electrical Grounding, Ground Faults, Grounding Electrode Systems and Conductors, Proper Grounding	1. Search Article 250 of the NEC to determine proper grounding requirements. 2. Identify different grounding electrode systems.	5	5	0
NEC Code Book, Use of the Grounding Conductor, Main Bonding Jumpers, Equipment Grounding Conductors, Bonding of Enclosures	1. Calculate proper size of main bonding jumpers. 2. Demonstrate the installation of main bonding jumpers, equipment grounding conductors, and bonding of enclosures. 3. Demonstrate knowledge and use of NEC code book.	8	5	0
Grounding Applications, Ground Fault Protection, Grounding Requirement for 1KV and over, Separately Derived Systems, Building Services, Calculations	1. Define where and how to use ground fault protection. 2. Demonstrate the calculation of ground fault currents.	8	5	0
Earth Testing Principles and Methods, Three-phase Transformers Review, WYE and Delta Connections, Transformer Over Current Protection	1. Describe the theory of three-phase transformers and transformer over current protection. 2. Perform short-circuit calculations. 3. Determine mathematically the transformer size for a given load. 4. Demonstrate proper connections for WYE and Delta connections.	8	5	0
Over Current Protection, Application of Fuses, Circuit Breakers, Short Circuit Calculations, Electrical Component Protection	1. Describe and define over current protection, fuses, circuit breakers, and electrical component protection. 2. Calculate short circuit calculations. 3. Demonstrate proper installation and connection of fuses, circuit breakers, and circuit component protection.	8	5	0
Electrical Load Calculations, Range Loads per NEC, Residential Loads per NEC, Multifamily Dwelling Loads per NEC	1. Describe and define electrical load. 2. Perform calculations for range loads, residential loads, and multifamily dwelling loads per NEC. 3. Select proper components for installation.	8	5	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	30	0