



Course Name	Equipment Grounding and Bonding (2023 NEC)
Credit Hours	4 Hours
Instructor(s)	Jerry Durham
Fee	\$55.00
Reference Materials	2023 Edition of the National Electrical Code

Course Description

This course is based on the 2023 NEC and provides electricians with a comprehensive look at grounding and bonding procedures and materials recognized by the Code.

Learning Objectives

At the end of this class, students will be able to:

- Define grounding and bonding.
- Understand critical differences between grounding and bonding.
- Explain the purpose of grounding an electrical system to earth.
- Understand the necessity of bonding the metal parts of an electrical system.
- Identify the different grounding and bonding connectors approved by the Code.
- Explain the approved bonding procedures for equipment grounding conductors.
- Understand a grounding electrode system.
- Identify grounding electrodes approved by the Code.
- Explain the life-safety issues related to equipotential bonding at swimming pools.
- Verify a proper ground connection using an Ohm meter.

Equipment Requirements

You must have an active, working internet connection to access this course online, as well as a platform to access the internet, such as a computer, tablet, or phone. All popular web browsers are supported, including Google Chrome, Mozilla Firefox, Safari, and Opera. No specialized software, speaker, microphone, or web camera is required.

Schedule and Location

This course is available online at any time at www.JadeLearning.com. Upon enrolling in the course, students will have access until the agency-issued course expiration date. After the access expiration date, the course will be removed from the student's account and any progress in the

course will be lost. Before the access expiration date, the student may sign in and out of the course as many times as needed to complete the course.

Student Support

Both general and technical support is available to the student before, during, and after taking the course online. Students have access to general customer support via phone, chat, and email. Students have access to the course instructor via a contact form in the course and email. All questions, concerns, and comments received will be responded to within one business day.

Participation/Interactivity Verification

Inactivity Timer - Students are automatically logged out of the training after 30 minutes if the system does not sense interactivity (e.g., a mouse click or typing).

Timed Logs - Per our company's record retention policy, each student's every log-in, log-out, and lesson/assessment completion time is tracked and retained as part of the student record.

Assessment - At least one content question is delivered at the bottom of each page of text and the section is not considered complete until the related question has been answered. The licensee must complete all multiple-choice questions with a score of at least 70% in order to get credit for the course. Question choices are randomized so each participant will have a unique testing experience. This course is set up to allow users to go back through the section questions and re-answer questions while they meet the time requirement.

Global Timer - Students will not get credit until they spend a minimum of 200 active minutes total in the course.

Identity Verification

Unique Username/Password - Each student that wants to complete a training course with us must create an account by registering a unique personal email address and password. The student must enter this unique identifier every time they want to access the course after logging out or being logged out.

Equipment Grounding & Bonding (2023 NEC) Timed Syllabus

Section	Title	Questions	Minutes
	Article 250 Part 1 General		
1	Grounding versus Bonding	1	5
2	Bonding Examples	1	5
3	Article 100. Grounding and Bonding Definitions Part I	1	5
4	Article 100. Grounding and Bonding Definitions Part II	1	5
5	250.1 Scope.	1	5
6	250.4 General Requirements for Grounding and Bonding	1	5
7	250.4(A) General Requirements for Grounding and Bonding. Grounded Systems	1	5
8	250.4(B) General Requirements for Grounding and Bonding. Ungrounded Systems	1	5
9	250.6 Objectable Current. Part I	1	5
10	250.6 Objectable Current. Part II	1	5
11	250.6 Objectable Current. Part III	1	5
12	250.8 Connection of Grounding and Bonding Equipment. Part I	1	5
13	250.8 Connection of Grounding and Bonding Equipment. Part II	1	5
14	250.10 Protection of Ground Clamps and Fittings.	1	5
15	250.12 Clean Surfaces.	1	5
16	250.21 Alternating-Current Systems of 50 Volts to 1000 Volts Not Required to Be Grounded. Part I	1	5
17	250.21 Alternating-Current Systems of 50 Volts to 1000 Volts Not Required to Be Grounded. Part II	1	5
18	250.25 Grounding of Systems Permitted to Be Connected on the Supply Side of the Service Disconnect.	1	5
19	250.28 Main Bonding Jumper and System Bonding Jumper	1	5
20	250.34 Portable, Vehicle-Mounted, and Trailer-Mounted Generators	1	5
21	250.50, 250.52, 250.66 Grounding Electrodes and Sizing Grounding Electrode Conductors	1	5
22	250.53(C) Grounding Electrode System Installation. Bonding Jumper	1	5
23	250.64(A) Grounding Electrode Conductor Installation. Aluminum or Copper-Clad Aluminum Conductors	1	5
24	250.64(B)(1),(B)(2), & (B)(3) Grounding Electrode Conductor. Protection from Physical Damage	1	5
25	250.64(G) Enclosures with Ventilation Openings.	1	5
26	250.68(C)(1) Grounding Electrode Conductor Connections	1	5
	Article 250 Part V Bonding		
27	250.90, 250.92. Bonding Methods	1	5
28	250.94, 250.96. Bonding Methods	1	5
29	250.97 Bonding for Over 250 Volts to Ground.	1	5

30	250.100 Bonding in Hazardous (Classified) Locations.	1	5
31	250.102(E) Grounded Conductor, Bonding Conductors, and Jumpers. Installation	1	5
32	250.104 Bonding of Piping Systems and Exposed Structural Metal	1	5
33	250.109 Equipment Grounding Conductors. Metal Enclosures	1	5
Part VI Equipment Grounding and Equipment Grounding Conductors.			
34	250.110 Equipment Fastened in Place (Fixed) or Connected by Permanent Wiring.	1	5
35	250.114 Equipment Connected by Cord and Plug.	1	5
36	250.118 Types of Equipment Grounding Conductors.	1	5
37	250.119 Identification of Wire-Type Equipment Grounding Conductors	1	5
38	250.120 Equipment Grounding Conductor Installation	1	5
39	250.122 Size of Equipment Grounding Conductors	1	5
Part VII Methods of Equipment Grounding			
40	250.130(C) Replacement of Nongrounding Receptacle or Snap Switch and Branch Circuit Extensions.	1	5
41	250.140 Frames of Ranges and Clothes Dryers.	1	5
42	250.148 Continuity of Equipment Grounding Conductors and Attachment in Boxes.	1	5
Part X Grounding of Systems and Circuits of over 1000 Volts			
43	250.190 Grounding of Equipment – Over 1000 Volts. Equipment Grounding Conductor	1	5
44	250.194 Grounding and Bonding of Fences and Other Metal Structures.	1	5
Applications of Grounding and Bonding			
45	404.9(B) General-Use Snap Switches, Dimmers, and Control Switches. Grounding.	1	5
46	408.40 Grounding of Panelboards.	1	5
47	501.30, 517.13, 517.14. Special Occupancies. Grounding and Bonding.	1	5
48	680.5 Ground-Fault Circuit-Interrupter (GFCI) and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection.	1	5
49	680.26 Swimming Pools, Fountains, and Similar Installations. Equipotential Bonding.	1	5
50	690.43 Solar Photovoltaic (PV) Systems. Equipment Grounding and Bonding.	1	5
Totals:		50	250
Student Minimum Time Required:			200