



## **NEC® 2020 Theory and Calculations**

Outline, Instructor, Presentation and Materials,  
Attendance Verification / Certificate of Completion, Learning Objectives, Student Feedback

### ***8 Course Elements, Approximately 1-Hour Each***

**Element 1 – Ohm’s Law and Voltage Drop, General Lighting and Receptacle Calculations –** Basic Ohm’s Law and single-phase and three-phase voltage drop are covered as well as general lighting calculations for one-family and multifamily dwellings. Included are practice review questions and answers. Total time: 59 minutes and 25 seconds

**Element 2 – General Lighting and Receptacle Calculations Continued –** General lighting and receptacle calculations are continued adding small appliances and laundry circuits and applying appropriate demand factors for single and multifamily dwellings. Also covered are lighting loads in other than dwelling units and the application of demand factors in various types of occupancies. Included are practice review questions and answers. Total time: 50 minutes and 28 seconds

**Element 3 – General Lighting and Receptacle Calculations Continued, Cooking Equipment Calculations, and Dryer Calculations –** General lighting and receptacle calculations are continued in various commercial applications. Cooking equipment calculations include household electric ranges in both single and multifamily dwellings as well as kitchen equipment in other than dwelling units. Household electric clothes dryers in single family and multifamily dwellings are also covered. Included are practice review questions and answers. Total time: 59 minutes and 51 seconds

**Element 4 – Fixed Appliance Calculations, and Grounding and Bonding –** Fixed appliance calculations in dwelling units are explained. Article 100 definitions that apply to grounding and bonding are clarified and illustrated. Sizing grounding electrode conductors for grounded ac services and separately derived systems utilizing various grounding electrodes are also covered. Included are practice review questions and answers. Total time: 57 minutes and 10 seconds

**Element 5 – Grounding and Bonding Continued –** Sizing grounding conductors are further explored focusing on main or system bonding jumpers and equipment bonding jumpers on the supply side of the service. Many examples are given for sizing the main grounding components of electrical services of various sizes. Included are practice review questions and answers. Total time: 59 minutes and 46 seconds

**Element 6 – Grounding and Bonding Continued, and Motor Calculations –** Grounding and bonding is further discussed, focusing on equipment bonding jumpers and equipment grounding conductors installed on the load side of the main service. Conductors are sized for various types of motors, including multiple motor applications, as well as short-circuit and ground-fault protection. Included are practice review questions and answers. Total time: 57 minutes and 43 seconds

**Element 7 – Generator Calculations, Welder Calculations, Transformer Formulas and Calculations, Miscellaneous Commercial Calculations, and Single-Family Service Calculations** – The sizing of conductors for generators and single and multiple welders are explained. Transformer formulas and calculations are also illustrated. Also covered are miscellaneous commercial calculations such as general-purpose receptacles, fixed multipurpose assemblies, heating and air conditioning, and sign circuits. The six basic areas of a single-family service calculation are introduced. Included are practice review questions and answers. Total time: 56 minutes and 13 seconds

**Element 8 – Single Family Service Calculations Continued, Multifamily Service Calculations, Mobile Home Park Calculations, Recreational Vehicle Park Calculations, and Commercial Service Calculations** – Single family service calculations are continued along with multifamily service calculations. Also covered are mobile home park calculations, recreational vehicle park calculations and commercial service calculations. Included are practice review questions and answers. Total time: 57 minutes and 40 seconds

### ***Instructor***

Larry D. Bobo has more than 40 years of experience working as an electrical contractor, business manager, general superintendent, project manager, service manager, estimator, foreman, and electrician. Larry has been conducting National Electrical Code and Continuing Education Workshops for over 30 years. Larry is a licensed Master Electrician in the state of Colorado (CO ME.0003118), is an education committee member, and instructor, for the International Association of Electrical Inspectors (IAEI) Rocky Mountain Chapter, and is certified by the Department of Labor and Industries for the state of Washington as an Electrical Administrator (AD BOBO\*LD865QK).

### ***Course Presentation and Materials***

All training is based on the NEC and conducted by Larry D. Bobo. This course is presented in PowerPoint and includes over 300 slides with Code references, photographs, professional graphics, and pop-quiz questions. It is required that each student have their NEC® 2020 Codebook handy for reference during training.

Please visit our website to view a 5-minute sample of how this workshop is presented online. Go to: [bobotechnologies.com/online-courses](http://bobotechnologies.com/online-courses) Then select: **Introduction Video**

### ***Attendance Verification / Certificate of Completion***

Through our online host, Digital Chalk, we can see who has registered for the course, and what their level of completion is. Each student creates an account and can complete the course at their own pace; we always recommend at least 1 Element, or hour, per session. Interaction with the course is required via questions, or “checkpoints,” placed randomly throughout each 1-hour Element. Failure to respond to the question will stop the course from advancing. A certificate is generated upon completion of all 8 hours. Each certificate includes the student name, license number, course title, course ID, and our provider information.

### ***Learning Objectives***

Our objective is to provide NEC training that is current and engaging. We highlight areas of the NEC that have changed from previous editions, emphasizing those areas that directly affect the electrician in the field.

### ***Student Comments/Feedback***

We have a “Feedback” link on our website, and also thru our online host; we encourage each student to let us know how we did; where we got it right, and what we can improve upon.