

**BASIC ELECTRICITY & MATHEMATICS
FOR UTILITY OPERATIONS****MARCH 28, 2023
OCTOBER 17, 2023**

NEPPA is pleased to continue offering a 1-day basic and technical prerequisite course for anyone looking to attend technical programs or to gain a basic understanding of electrical theory, concepts and mathematic principles.

Basic Electricity & Mathematics for Utility Operations is designed to be an introduction to the electrical concepts and mathematic principles needed to understand electricity and electrical equipment. This course is a foundational level course that is a basis for additional course work in specific disciplines such as substation, overhead lines and metering.

WHO SHOULD ATTEND

This course is designed for:

- All field operations personnel including:
 - Meter Technicians
 - Lineworkers
 - Substation Technicians
- Customer Service or Office Personnel looking to understand the product they sell every day.
- Supervisors or Managers transitioning from other departments or disciplines.

LEARNING OBJECTIVES

Upon completion of this one-day course, participants will be able to successfully:

1. Practice and solve mathematical problems used in electrical power measurements.
2. Demonstrate a basic understanding of electrical theory including electricity and magnetism.
3. Ability to differentiate between DC and AC circuit function.
4. Explain the difference and interconnection of generation, transmission and distribution of electricity.
5. Demonstrate an understanding of energy and demand, and the difference between kW and kWh.
6. Ability to recognize the utmost importance of electrical safety.



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TOPICS COVERED

Basic Electricity:

- Atoms
- Conductors & Insulators
- Ohms law
- Voltage, Current, Resistance
- Magnetism
- Generation
- AC sine waves
- Inductance, Capacitance
- Transformers
- Series & Parallel circuits

Basic Mathematics:

- Whole numbers
- Fractions decimals
- Powers and roots
- Algebra, Trigonometry
- Vectors

Electric Power & Energy:

- Resistance, current and energy
- Energy calculations
- Electric Power
- The power chart (triangle)
- Demand calculations
- Demand billing

Electrical Safety:

- Physical & Electrical Hazards
- Working with energized parts
- PPE
- Safe Work Practices
- Effect of current and voltage on the human body
- Electric Arcs

Power System Overview:

- Generation
- Transmission
- Distribution

AGENDA

Agenda details are subject to change.

8:00 am	Welcome & Introductions	12:45pm	Module 5: Power System Overview
8:15 am	Module 1: Basic Electricity		
9:15 am	Break	1:45 pm	Final Exam & Practical
9:30 am	Module 2: Basic Mathematics	2:30 pm	Review Final
10:45 am	Module 3: Electrical Safety	2:45 pm	Certificates of Completion
11:30 am	Lunch	3:00 pm	Adjourn
12:00 pm	Module 4: Electric Power & Energy		

INSTRUCTOR

Tim Richardson, P.E., Technical & Safety Trainer



Tim Richardson joined NEPPA in September of 2019 and has been an asset to the training team. Tim has a long history working in the electric utility industry, including as General Manager of Belmont Municipal Light Department from 1995 - 2007.

Most recently, Tim has worked as Principal of Fundy Power Services, LLC and at Consulting Engineers Group prior to that.

Tim brings a wealth of both technical and safety expertise to the organization and applies his expertise of both in an easy-to-understand and easy-to-learn approach.

