Colorado CTE

Electrical Energy Transmission & Distribution (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Understand electrical transmission and distribution through public and residential systems ELTD.01

01. Understand and analyze the process of energy generation and transmission ELTD.01.01

- a. Comprehend the basic principles of electricity and electrical power, including how electricity is generated and used as a power source. ELTD.01.01.A
- b. Understand the basic electrical science and pragmatic and theoretical applications of voltage, amperage, resistance, and heat transfer and flow in electrical and electronic circuits and equipment. ELTD.01.01.B
- c. Understand scientific principles (including mechanical, fluid, and thermodynamic) and chemical functions common to energy conversion processes and energy transmission systems. ELTD.01.01.C
- d. Perform the mathematical functions, including measurement scales, tables, and systems used for safe energy conversion processes and energy transmission systems. ELTD.01.01.D
- e. Interpret the basic principles of electricity and electrical power required of safe and economical energy conversion processes and energy transmission systems. ELTD.01.01.E
- f. Apply the principles of electrical codes, wiring applications, and circuit and device troubleshooting techniques. ELTD.01.01.F
- g. Understand the principles of natural gas codes, distribution applications, and troubleshooting techniques in distribution systems. ELTD.01.01.G

02. Understand the effects of financial, technical, and economic trends on the past, current, and future technology in public & residential utility industries ELTD.01.02

- a. Analyze the effects of financial, technical, and economic trends on the past, present, and future of the public utility industries. ELTD.01.02.A
- b. Explore the public utility industry's role in the local, state, and national community infrastructure. ELTD.01.02.B

03. **Understand the role and function of tools and machines in energy distribution industries** ELTD.01.03

a. Select and safely use hand and power tools, equipment, and machines common to residential and commercial energy and utilities systems. ELTD.01.03.A

b. Understand how tools, equipment, and machines may be used to safely measure, test, diagnose, and analyze relationships between voltage, current, resistance, power, and gas and fluid pressure and flow rate. ELTD.01.03.B

c. Know how tools, equipment, and machines may be used to safely measure, test, diagnose, and analyze tuned circuits, sine wave, and resonant and related characteristics of alternating current in alternating current applications. ELTD.01.03.C

04. **Understand the value and necessity of practicing occupational safety in residential and commercial energy and utility industries** ELTD.01.04

a. Know the basic fire hazards in the energy and utility industry. ELTD.01.04.A

b. Apply the elements of combustion, fire classifications, and fire-fighting equipment and techniques specific to the residential and commercial energy and utility industry. ELTD.01.04.B

c. Explain the basic theory and concepts of electrostatics. ELTD.01.04.C