ELECTRICAL THEORY

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ELM 101 Electrical Workforce Training 1-7 Credits
The first of eight courses offered in the Electrical Workforce Training Program. Offers the student a planned educational experience in the electrical field by providing online electrical craft training, related laboratory experiences, and supervised performance task completion assessment. May be repeated for up to seven credits. Prerequisite:

ELM 102 Elect Workforce Train II 1-7 Credits
The second of eight courses offered in the Electrical Workforce Training Program. Offers the student a planned educational experience in the electrical field by providing online electrical craft training, related laboratory experiences, and supervised performance task completion assessment. May be repeated for up to seven credits. Prerequisite:

ELM 103 Elect Workforce Train III 1-7 Credits
The third of eight courses offered in the Electrical Workforce Training Program. Offers the student a planned educational experience in the electrical field by providing online electrical craft training, related laboratory experiences, and supervised performance task completion assessment. Unlimited repeatability. Prerequisite:

ELM 104 Elec Workforce Train IV 1-7 Credits
The fourth of eight courses offered in the Electrical Workforce Training Program. Offers the student a planned educational experience in the electrical field by providing online electrical craft training, related laboratory experiences, and supervised performance task completion assessment. Prerequisite:

ELM 105 Elect Workforce Train V 1-7 Credits
The fifth of eight courses offered in the Electrical Workforce Training Program. Offers the student a planned educational experience in the electrical field by providing online electrical craft training, related laboratory experiences, and supervised performance task completion assessment. Prerequisite: Must have completed ELM 104.

ELM 112 Electrical Theory, DC 1-4 Credits
The study of matter, atomic structure, electron theory, sources of electricity, and magnetism. Theory and shop application in Ohm's Law, voltage, current, resistance, and power in series, parallel, and series-parallel direct current circuits. Prerequisite: Must have been accepted into the Electrical Technology Program.

ELM 120 Low Voltage Systems 1-3 Credits
An introduction to low voltage systems used to distribute, carry, capture, and display voice, video, audio, and data signals. Topics include entertainment (video and audio media systems), communications (telephone, fax, modem, networks, and publication address systems), life safety (access control, alarm systems, and video surveillance), environmental control (HVAC and energy management), and automation controls (residential and commercial buildings). Prerequisite: Must have been accepted into the Electrical Technology Program.

ELM 121 Circuit Design 1-2.5 Credits
Developing and drawing electrical diagrams and graphs using standard electrical and JIC symbols. Prerequisite: Must have completed ELM 112 or have been accepted into the Electrical Technology Program.

ELM 122 AC Theory 4 Credits
Analyze AC series, parallel, and combination circuits with resistance, inductance, and capacitive elements using mathematics, measuring devices, and other test equipment. Prerequisite: Must have completed ELM 112 or have been accepted into the Electrical Technology Program.

ELM 123 Solid State 1-2.5 Credits
Study of the theory and operation of such solid-state devices as diodes, transistors, diacs, triacs, and SCRs. Prerequisite: Must have completed ELM 122 or have been accepted into the Electrical Technology Program.

ELM 124 DC Gen, Motors & Controls 2 Credits
Theory, design, applications, and testing of direct current (DC) generators, DC motors, and the study of such DC control devices as manual starting rheostats, reduced-voltage starting mechanisms, and speed controls. Prerequisite: Must have completed ELM 122 or have been accepted into the Electrical Technology Program.

ELM 125 AC Motors and Alternators 2 Credits
Theory, design, application, and testing of alternating current (AC) motors and alternators; single- and three-phase generation of alternating current; paralleling alternators; and calculating load and power factor characteristics under various load conditions. Prerequisite: Must have completed ELM 124 or have been accepted into the Electrical Technology Program.

ELM 126 Motor Maintenance 2 Credits
Explores the mechanical aspects of small and larger motor disassembly and assembly; bearing, commutator, slip ring and brush care; electrical maintenance; safety planning; and variable frequency drives. Prerequisite: Must have completed ELM 125 or have been accepted into the Electrical Technology Program.

ELM 127 Intro to AC Controls .5-3 Credits
Introduction to pilot devices, wiring diagrams, ladder diagrams, and basic motor circuits. Areas of emphasis include two- and three-wire controls, parallel stop-start, and hand-off automatic controls. May be repeated up to three credits. Prerequisite: Must have completed ELM 125 or have been accepted into the Electrical Technology Program.

ELM 128 Transfrmrs & Ind Lighting 4 Credits
Comprehensive study of the theory and operation of transformers and industrial lighting. The functions of various types of transformers and the maintenance and repair of industrial lighting systems will be emphasized. Perform the actual hookup and testing of basic single-phase and three-phase transformer

connections. Observe and demonstrate proper safety and maintenance techniques and develop service wiring techniques. Prerequisite: Must have completed ELM 122 or have been accepted into the Electrical Technology Program.

ELM 131 National Electric Code 2.5 Credits
Survey of the National Electric Code and its application to the safe installation of electrical conductors and equipment. Prerequisite: Must have completed ELM 122 or have been accepted into the Electrical Technology Program.

ELM 132 Digital Concepts 1-2.5 Credits
Introduction to digital electronics including numbering systems, binary codes, Boolean algebra, and logic hardware. Prerequisite: Must have completed ELM 123 or have been accepted into the Electrical Technology Program.

ELM 133 Advanced AC Controls 4 Credits
Applications and testing of a variety of AC controls, including limit switches, control relays, timing circuits, control transformers, and variable frequency drives. Prerequisite: Must have completed ELM 127 or have been accepted into the Electrical Technology Program.

ELM 134 Intro Progrm Logic Cntrl 2.5 Credits
Introduction to programmable controller hardware, numbering systems, memory organization, and peripheral devices. Prerequisite: Must have completed ELM 127 and ELM 132 or have been accepted into the Electrical Technology Program.

ELM 135 Natl Elec Code 430 1 Credits
In-depth study of Article 430 of the National Electric Code and its application to motors, motor circuits, and controllers. Prerequisite: Must have completed ELM 133 or have been accepted into the Electrical Technology Program.

ELM 136 Programmable Controls App 2.5 Credits
Practical experience in programming circuits using relay-type instructions, timers, counters, data manipulation, arithmetic functions, and other advanced features and techniques. Prerequisite: Must have completed ELM 133 and ELM 134 or have been accepted into the Electrical Technology Program.

ELM 141 Blueprint Reading 2 Credits
Focus on electrical prints, drawings, symbols, and specifications for construction and electrical plans. Prerequisite: Must have completed ELM 121 and ELM 128 or have been accepted into the Electrical Technology Program.

ELM 142 Raceways 2.5 Credits
Introduction to the types and applications of raceways, wireways, and ducts. Students will learn how to cut, ream, thread, connect, and bend conduit using hand, mechanical, hydraulic, and electric benders. Prerequisite: Must have been accepted into the Electrical Technology Program.

ELM 143 Wiring Techniques 1-4 Credits
Practical application in a variety of building types and remodeling of existing buildings. Course will include job building, material estimation, tool and material use, and installation techniques. Prerequisite: Must have completed ELM 128 and ELM 131 and ELM 141 and ELM 142 or have been accepted into the Electrical Technology Program.