ELECTRICITY

ELECTRICITY (ELTY)

DIVISION: Career Technical Education

ELTY 012 BASIC ELECTRICITY – ELECTRONICS
2 unit
Transfer Credit: CSU
Fundamental concepts, theories, laws and devices used in electricity and electronics. Topics include: electricity hazards, electric charge, current, voltage, resistance: DC and AC circuits; Ohm's and power laws; circuit analysis and troubleshooting. Hands-on use of electronics components, lab equipment and instrumentation. Total of 18 hours lecture and 54 hours laboratory.
Grade Mode: *Audit, Letter Grade*

ELTY 217 ELECTRICAL INSPECTION AND CODES
2 unit
Recommended Preparation: *ELTY 248A or ELTY 248B or familiarity with basic residential Wiring and successful completion of a first year algebra course*

Residential wiring requirements based on current National Electrical Code (NEC) with emphasis on the importance of safety and quality workmanship. Inspection criteria based on National Electrical Code. Plan reading, residential service sizing, wiring method, and grounding and bonding for electrical wiring. NEC requirements for photo-voltaic solar systems. No credit if taken after ELTY 217A or 217B. Total of 36 hours lecture.
Grade Mode: *Audit, Letter Grade*

ELTY 218 ELECTRICAL INSPECTION AND CODES – UPDATE
1 unit
Prerequisite(s): *ELTY 217*

Review of recent changes and revisions to local, state and national electrical codes and standards. Emphasis on new methods of code applications and calculations. Code reference on installation of new electrical hardware and materials. Discussion of future trends of electrical design concepts. Total of 18 hours lecture.
Grade Mode: *Audit, Letter Grade*

ELTY 248A INTRODUCTION TO ELECTRICAL TECHNOLOGY
4 unit
Recommended Preparation: *High school algebra*

Fundamental theory and application of DC circuits for the electrical industry. Explanation of electrical terms, codes and components. Measuring electrical parameters with state-of-the-art measurement instruments. Hands-on laboratory assignments with instruments, test techniques, troubleshooting procedures and schematic reading. Instructional field trips. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*

ELTY 248B ALTERNATING CURRENT CIRCUITS – PRINCIPLES AND APPLICATIONS
4 unit
Prerequisite(s): *ELTY 248A*

Fundamentals of alternating current including series and parallel AC circuits. Circuits with resistors, capacitors, and inductors are covered, both analytically and experimentally. Practical applications in electrical industries. Explanation of electrical codes, standards, terms and components. Hands-on laboratory assignments with state-of-the-art measurement instruments, test techniques and troubleshooting procedures. Instructional field trips. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*

ELTY 248C ELECTRICAL POWER DISTRIBUTION SYSTEMS AND MACHINERY
4 unit
Prerequisite(s): *ELTY 248B*

Theory and application of electromagnetic interaction in power distribution systems and machinery for the electrical industry. Investigates the theory and applications of motors, generators, transformers, electromagnetic systems and their interaction in power distribution systems and machinery. Principles of AC/DC equipment installation, safety procedures, codes and standards. Hands-on laboratory experiments to develop knowledge and skills in electrical machinery. Required instructional trips. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*

ELTY 248D PROGRAMMABLE LOGIC CONTROLLERS
4 unit
Prerequisite(s): *ELTY 248C*

Exploration of Programmable Logic Controllers for industrial machinery and processes. Hands-on laboratory assignments with state-of-the-art measurement instruments and troubleshooting concepts. Projects include 3-phase motor, parking lot and traffic Light. Required instructional trips. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*

ELTY 250 INTRODUCTION TO PHOTOVOLTAIC SYSTEMS
4 unit
Photovoltaic terminology, concepts, vocabulary, techniques and safety. History, applications and benefits of the different PV systems. Basic electrical theories related to photovoltaic. PV system sizing and cost estimating. Voltage, current, resistance and power calculation and measurements. Specification of the components such as inverter, charge controller, combiner, battery and generator. Required instructional trips. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*

ELTY 251 PHOTOVOLTAIC THEORY AND INSTALLATION TECHNIQUES
4 unit
Prerequisite(s): *ELTY 250*

Preparation for entry level employment in photovoltaic (PV) industry. Instruction includes solar electricity fundamentals, PV safety, site analysis, PV system sizing and design, required components and equipment. Product installation, troubleshooting, net metering laws and National Electrical Code for PV requirements. Successful participants will be qualified to sit for the North American Board of Certified Energy Practitioners (NABCEP) "PV Installer Entry Level Certificate of Knowledge" examination. Instructional trips may be required. Total of 54 hours lecture and 54 hours laboratory.
Grade Mode: *Letter Grade*