STRANDS AND STANDARDS
ELECTRONICS 3

Course Description

The third in a sequence of courses that prepares individuals to apply technical knowledge and skills to assemble and operate electrical/electronic equipment used in business, industry, and manufacturing. Instruction includes training in safety and passive AC circuits with topics addressing waveforms, transformers, capacitors, inductors, reactance, impedance and resonance.

Core Code	38.01.00.00.023
Concurrent Enrollment Core Code	38.01.00.13.023
Units of Credit	0.5
Intended Grade Level	11-12
Prerequisite	Electronics 2
Skill Certification Test Number	None
Test Weight	0.5
License Type	Secondary Education 6-12
Required Endorsement(s)	Technology & Engineering, or
	T&E Electronics

STRAND 1

Students will follow safety practices.

Standard 1

Identify potential safety hazards and follow general laboratory safety practices.

- Assess workplace conditions regarding safety and health.
- Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite.
- Describe typical electric shock hazards in industry.
- Describe the effects of electricity on the human body.
- Locate and understand the use of shop safety equipment.
- Select appropriate personal protective equipment.

Standard 2

Use safe work practices.

- Use personal protective equipment according to manufacturer rules and regulations.
- Follow correct procedures when using any hand or power tools.
- Ref: https://schools.utah.gov/cte/engineering/resources under the Safety Program and Management tab.

Standard 3

Complete a basic safety test without errors (100%) before using any tools or shop equipment.

STRAND 2

Students will understand AC waveforms vs. DC and the advantages of using AC power for distribution.

Standard 1

Describe advantages of using AC for electrical power distribution.

Standard 2

Describe the characteristics of sinusoidal waveforms including frequency, period, and amplitude at any point within the wave.

Standard 3

Determine peak, peak-to-peak, average, and RMS values for a given sine wave.

STRAND 3

Students will understand how to change AC voltage and current levels using transformers.

Standard 1

Describe step-up vs. step-down as related to turns ratio.

Standard 2

Describe primary and secondary as related to step-up and step-down.

Standard 3
Determine input and output voltage & current based on turns ratio.

STRAND 4
Students will know how to calculate capacitance when connecting multiple capacitors.

Standard 1
Determine the equivalent capacitance of capacitors connected in series.

Standard 2
Determine the equivalent capacitance of capacitors connected in parallel.

STRAND 5
Students will know how to calculate inductance when connecting multiple inductors.

Standard 1
Determine the equivalent inductance of inductors connected in series.

Standard 2
Determine the equivalent inductance of inductors connected in parallel.

STRAND 6
Students will know how to calculate capacitive and inductive reactance.

Standard 1
Describe the concept of reactance and its unit of measure.

Standard 2
Determine the capacitive reactance of a capacitor given the frequency.

Standard 3
Determine the inductive reactance of an inductor given the frequency.

STRAND 7
Students will understand circuit impedance.

Standard 1
Describe the concept of impedance and its unit of measure.

Standard 2
Determine the impedance of a basic RC or RL series circuit.

STRAND 8
Students will understand resonance and how it is used in circuits.

Standard 1

Describe the concept of resonance.

Standard 2

Describe applications for resonance in AC circuits.

Skill Certificate Test Points by Strand

None

Performance Skills

1. Create and utilize an engineering notebook per established conventions. https://schools.utah.gov/cte/engineering/resources
2. Demonstrate practice of the *Technology & Engineering Professional Workplace Skills*. https://schools.utah.gov/cte/engineering/resources
3. Participate in a significant activity that provides each student with an opportunity to render service to others, employ leadership skills, or demonstrate skills they have learned through this course, preferably through participation in a Career & Technical Student Organization (CTSO) such as the Technology Student Association (TSA).