STRANDS AND STANDARDS
ELECTRONICS 2

Learning that works for Utah
CTE®

Course Description

The second 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, numbering systems, Boolean algebra, logic diagrams, digital devices, and combinational logic circuits.

Core Code	38.01.00.00.022
Concurrent Enrollment Core Code	38.01.00.13.022
Units of Credit	0.5
Intended Grade Level	10-12
Prerequisite	Electronics 1
Skill Certification Test Number	652
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 various number systems used in digital electronics.

Standard 1

Understand the structure of, and how to count in, various numbering systems.
- Use the decimal number system.
- Use the octal number system.
- Use the hexadecimal number system.
- Use the binary number system.

Standard 2

Perform operations in various numbering systems.
- Convert between decimal and binary.
- Convert between octal and binary.
- Convert between hexadecimal and binary.

STRAND 3

Students will understand the functions of typical logic gates and their logic states.

Standard 1

Describe the function of and create truth tables for typical logic gates.

- AND, NAND
- OR, NOR
- XOR, XNOR
- Buffer (YES), Inverter (NOT)

STRAND 4

Students will understand, construct, and test combinational logic circuits.

Standard 1

From schematic diagrams and specifications, write a truth table and the Boolean equation for combinational logic circuits.

Standard 2

Simplify combinational logic circuits using Boolean identities, De Morgan's Theorems, and logical equivalencies.

Standard 3

Construct combinational logic circuits.

Standard 4

Predict the logic levels in all parts of combinational logic circuits.

Standard 5

Use a logic probe to test and verify logic levels in all parts of combinational logic circuits.

STRAND 5

Students will understand, construct, and test sequential logic circuits.

Standard 1

Define the properties of:
- D flip-flop
- JK flip-flop

Standard 2

Describe the operation and application of:
- shift registers
- frequency dividers and counters
- synchronous up/down and shift counters
- multi-vibrators

Standard 3

Construct and test sequential logic circuits.

Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand					Total Points	Total Questions
		1	2	3	4	5		
Electronics 2	652	4	10	16	6	4	40	27

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).