# Fundamentals of Electricity & Electronics Course No. 41170 Credit: 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Energy (17.2071); Networking & Telecommunications (11.0901)

Course Description: A **Technical level** course designed to instruct students in terminology and basic concepts related to the field electricity and electronics.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Electricity & Electronics Fundamentals

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Students will apply proper OSHA Safety  Standards to their learning in electricity and  electronics |  |
| 1.2 | Students will relate, identify, and apply Ohm’s law to voltage, current, resistance, power, and energy. |  |
| 1.3 | Students will define and explain direct and alternating currents along with components and schematics used in electronics circuitry. |  |
| 1.4 | Students will correctly calculate and set up lab equipment for safety, design, test, using Ohm’s law and circuit measurements. |  |
| 1.5 | Students will read and interpret color codes and symbols to identify electrical components and values. |  |
| 1.6 | Students will measure properties in a circuit using DMM meters, oscilloscopes, and power supplies. |  |
| 1.7 | Students will compute, measure, apply, construct, and verify Ohm’s law as it applies to Series and Parallel circuits |  |
| 1.8 | Students will apply, construct, and verify the operation of DC circuits that demonstrate the maximum power of transfer theory. |  |
| 1.9 | Students will define magnetic properties of circuits and devices. |  |
| 1.10 | Students will define, identify, verify and troubleshoot RC and RL time constant circuits. |  |
| 1.11 | Students will define basic motor theory and operation. |  |
| 1.12 | Students will define, construct, verify, and troubleshoot AC capacitive and inductive circuits |  |
| 1.13 | Students will define, construct, verify, and troubleshoot AC circuits utilizing transformer. |  |
| 1.14 | Students will define, construct, and verify series and parallel resonant circuits. |  |
| 1.15 | Students will define, construct, verify, and troubleshoot filter circuits. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

(785) 296-4908

[pathwayshelpdesk@ksde.org](mailto:pathwayshelpdesk@ksde.org)



900 S.W. Jackson Street, Suite 102

Topeka, Kansas 66612-1212

[https://www.ksde.org](https://www.ksde.org/)

The Kansas State Department of Education does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities and provides equal access to any group officially affiliated with the Boy Scouts of America and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: KSDE General Counsel, Office of General Counsel, KSDE, Landon State Office Building, 900 S.W. Jackson, Suite 102, Topeka, KS 66612, (785) 296-3201.