

# Curriculum Outline



**Campbell High School**

Character – Courage – Respect – Responsibility

Course & Level: Electricity and Home Improvement

Department: Technology Education

Teacher: Mr. Mower

Grade level: 9-12

## Description of Course:

Electrical devices and their increasing use for Home Repair are rapidly improving the efficiency of energy use and quality of life at home. This course is designed to familiarize students with electro-magnetic theory, electric generation, circuits, safety, hand and power tools, schematics, simple plumbing and home improvement projects. Home appliances and equipment repair may be included in this introductory course.

## School – Wide Expectations:

### Academic

1. Read, write and speak effectively
2. Exhibit critical thinking and problem solving skills
3. Use resources to obtain information and facilitate learning

### Civic/Social

1. Exhibit personal responsibility
2. Work cooperatively in an atmosphere of mutual respect
3. Contribute to the stewardship of the community

*The school-wide expectations are incorporated into all courses at Campbell High School. Underlined words in the following text illustrate this alignment between the school-wide expectations and the course*

## Core Competencies and alignment with State Standards:

**Perform** – Students will safely perform activities in class that lend to their understanding of electricity in the home. The student will demonstrate an understanding of basic electrical theory and the application of Ohm's Law.

A2. Exhibit the safe and proper selection, use and maintenance of technical equipment, materials, and processes.

D1. Design, develop, manage, and evaluate activities using identified problem-solving techniques.

**Respond** - The student will demonstrate proper house wiring practice and installation of basic outlets, lamps and switches The student will be able to measure resistance, voltage and amperage using a multimeter.

A1. Select and use appropriate measuring tools to accurately gather, manipulate, and communicate information.

A3. Discover and develop talents, aptitudes, and interests of the individual related to technical pursuits.

A4. Demonstrate an awareness of career opportunities and requirements needed to make informed and meaningful choices in their education/employment in technical occupations.

**Engage** The students will demonstrate an understanding of uses and applications of electronic components in integrated circuits, examining the efficiency of energy use and quality of life at home created by electronic products.

B1. Design, schedule, manage, and assess technical processes and systems.

C1. Demonstrate those technical skills needed to find, use and communicate information effectively in a technological world.

E1. Exhibit an understanding of the relationship between academic concepts and practices to their applications in a technological setting.

F1. Evaluate the effects of technology's development on society through time.

F2. Evaluate examples of how technological systems and processes have developed to satisfy human needs and wants.

H1. Demonstrate an understanding of and an appreciation for the importance of accepting individual responsibility, developing a solid work ethic and learning to plan and work effectively.

**Suggested Texts and Media (Software, A/V, etc.):**

Miscellaneous teacher- developed informational hand-outs

33-1 Experiments from Chaney Electronics

Robotics Experiments from Chaney Electronics

The Complete Introductory Computer Hardware Course from Marcraft

**Lecture and Demonstration –**

At the beginning of each electrical investigation, there is a teacher demonstration re-enforcing proper technique and safety considerations. There are also basic recommendations on outlet selection, outlet and switch location, electrical component installation and testing. This includes wiring code.

When the electronics investigation begins, the class depends on the 33-1 experiments recommended by Chaney Electronics. Supplement instruction is offered through PowerPoint. Additional research on how components work is an Internet exercise. A demonstration is provided on soldering technique.

**Mastery through Activity**

In house wiring, students are provided electrical boxes, outlets, switches, lamps and wiring to create several circuits including a 3-way switch problem. Skill level is ascertained through connections and success.

In the electronics investigation, students follow a manual of 33 experiments that introduce them to diodes, capacitors, transistors, and other electronic components. This requires an understanding of proper connections and function.

**Project Development**

Students are expected to work through a minimum of two electronic challenges in kit format. This requires successful soldering and an understanding of how the components interact.

Additional projects are elective in nature. Students will choose to work with a robotics challenge, simple wiring of a lamp, or building a computer. Choices are determined by interest and/or skill level.

**Suggested Assessment Strategies:**

**Students are given multiple opportunities to meet competencies through project based learning. Daily work in the shop is formative and project completion is summative.**