Automotive Electrical Components I

Course Credit	1.0
Grade Levels	9-12
Prerequisites	Automotive Technology Foundations is required as a prerequisite or a corequisite.

Automotive Electrical Components I is designed to equip students with foundational knowledge and skills regarding safety, electrical, and electronics systems. Standards are designed to equip students to diagnose and repair engine performance related electrical systems. This course incorporates personal and environmental safety practices associated with clothing, eye protection, hand tools, power equipment, ventilation, and the handling, storage, and disposal of chemicals and materials in accordance with local, state, and federal safety and environmental regulations.

Content standards are written to meet Automotive Service Excellence (ASE) Education Foundation requirements, which also specify task lists, program hours, and safety standards.

Career and Technical Student Organizations are integral, co-curricular components of each career and technical education course. These organizations enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and access opportunities for personal and professional growth. Students in the Transportation, Distribution and Logistics career cluster affiliate with SkillsUSA.

Foundational standards, shown in the table below, are an important part of every course. Through these standards, students learn and apply safety concepts, explore career opportunities and requirements, practice the skills needed to succeed in the workplace, develop leadership qualities and take advantage of the opportunities afforded by Career and Technical Student Organizations (CTSOs), and learn and practice essential digital literacy skills. The foundational standards are to be incorporated throughout the course.

Each foundational standard completes the stem *"**Students will**..."*

Foundational Standards

1. Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and handling hazardous materials and forces.
2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.
3. Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.
4. Advocate and practice safe, legal, responsible, and ethical use of information and technology tools specific to the industry pathway.
5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.
6. Apply literacy, mathematical, and scientific principles and precision measurements when diagnosing problems and making repairs.
7. Work independently, collaboratively, and in teams to explore concerns, find causes, and take appropriate action by applying principles of STEM.

AUTOMOTIVE ELECTRICAL COMPONENTS CONTENT STANDARDS

Each content standard completes the stem *"**Students will**…"*

General Electrical and Electronic Systems	1. Identify electrical and electronic system components and configuration. 2. Solve for unknown values in electrical and electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's law). 3. Use wiring diagrams to trace electrical and electronic circuits. 4. Demonstrate proper use of a digital multimeter (DMM), test lights, and fused jumper wires when measuring source voltage, voltage drop (including grounds), current flow, and resistance, testing fusible links, circuit breakers, and fuses. 5. Explain causes and effects from shorts, grounds, opens, and resistance problems in electrical and electronic circuits. 6. Measure key-off battery drain (parasitic draw). 7. Repair and replace connectors, terminal ends, and wiring of electrical/electronic systems, including solder repair.
Starting and Charging System	8. Inspect and test components of starting and charging systems by making voltage and current draw and output measurements. 9. Remove and install starter/generator (alternator) in a vehicle. 10. Describe the operation of an automatic idle-stop and start-stop, keyless entry, and remote start systems.

Lighting, Instrument Cluster, Driver Information, and Body Electrical Systems	11. Inspect and replace interior and exterior lamps including sockets. 12. Aim headlights. 13. Disable and enable supplemental restraint system (SRS) and verify indicator lamp operation. 14. Remove and reinstall the door panel. 15. Verify windshield wiper and washer operation; replace wiper blades.