

STRANDS AND STANDARDS

ASE ELECTRICAL/ELECTRONICS



Course Description

This course is part of a sequence that prepares individuals to engage in the servicing and maintenance of all types of automobiles. Instruction includes training in safety, the diagnosis of malfunctions and repair of electrical systems. This course is based on the Automotive Service Excellence (ASE) task list. Work ethics and productivity are an integral part of the classroom and lab activities of these courses. Prerequisite, Introduction to Automotive. The most current information can be found at the AST Task List at the following address:

<https://www.asealliance.org/natef-accreditation/program-standards>.



Intended Grade Level	11-12
Units of Credit	0.5
Core Code	40.09.00.00.024
Concurrent Enrollment Core Code	40.09.00.13.024
Prerequisite	Introduction to Automotive
Skill Certification Test Number	Industry test 957
Test Weight	1.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Automotive Service
Endorsement 2	N/A
Endorsement 3	N/A

STRAND 1

Students will be able to understand, identify, and properly diagnose general electrical system problems.

Standard 1

Use wiring diagrams during diagnosis of electrical circuit problems.

Standard 2

Check electrical circuits with a test light; determine needed repairs.

Standard 3

Check voltages and voltage drops in electrical/electronic circuits using a DVOM (DMM); determine needed repairs.

Standard 4

Check current flow in electrical/electronic circuits and components using an ammeter; determine needed repairs.

Standard 5

Check electrical circuits using jumper wires; determine needed repairs.

Standard 6

Find shorts, grounds, opens, and high resistance problems in electrical/electronic circuits; determine needed repairs.

Standard 4

Measure and diagnose the cause(s) of abnormal key-off battery drain; determine needed repairs.

Standard 8

Inspect and test fusible links, circuit breakers, and fuses; replace as needed.

Standard 9

Inspect and test switches, connectors, and wires of electrical/electronic circuits; repair or replace as needed.

Performance Skill

Understand, identify, and properly diagnose general electrical system problems.

- Use wiring diagrams during diagnosis of electrical circuit problems.
- Check electrical circuits with a test light; determine needed repairs.
- Check voltages and voltage drops in electrical/electronic circuits using a DVOM (DMM); determine needed repairs.
- Check current flow in electrical/electronic circuits and components using an ammeter; determine needed repairs.
- Check electrical circuits using jumper wires; determine needed repairs.
- Find shorts, grounds, opens, and high resistance problems in electrical/electronic circuits; determine needed repairs.
- Measure and diagnose the cause(s) of abnormal key-off battery drain; determine needed repairs.
- Inspect and test fusible links, circuit breakers, and fuses; replace as needed.
- Inspect and test switches, connectors, and wires of electrical/electronic circuits; repair or replace as needed.

STRAND 2

Students will be able to understand, identify, and properly diagnose battery problems.

Standard 1

Perform battery state of charge test; determine needed service.

Standard 2

Perform battery capacity (load, high rate discharge) tests; determine needed service.

Standard 3

Maintain or restore electronic memory functions.

Standard 4

Inspect, clean, fill, or replace battery.

Standard 5

Perform slow/fast battery charge.

Standard 6

Inspect and clean battery cables, connectors, clamps, and hold downs; repair or replace as needed.

Standard 7

Start a vehicle using jumper cables and a battery, or auxiliary power supply.

Performance Skill

Understand, identify, and properly diagnose battery problems.

- Perform battery state of charge test; determine needed service.
- Perform battery capacity (load, high rate discharge) tests; determine needed service.
- Maintain or restore electronic memory functions.
- Inspect, clean, fill, or replace battery.
- Perform slow/fast battery charge.
- Inspect and clean battery cables, connectors, clamps, and hold downs; repair or replace as needed.
- Start a vehicle using jumper cables and a battery, or auxiliary power supply.

STRAND 3

Students will be able to understand, identify, and properly diagnose and repair starting systems.

Standard 1

Perform starter current draw and circuit voltage drop test; determine needed repairs.

Standard 2

Inspect and test starter relays and solenoids; replace as needed.

Standard 3

Remove and replace/reinstall starter motor.

Standard 4

Perform starter free running (bench) tests; determine needed repairs.

Performance Skill

Understand, identify, and properly diagnose and repair starting systems.

- Perform starter current draw and circuit voltage drop test; determine needed repairs.
- Inspect and test starter relays and solenoids; replace as needed.
- Remove and replace/reinstall starter motor.
- Perform starter free running (bench) tests; determine needed repairs.

STRAND 4

Students will be able to understand, identify, and properly diagnose and repair charging systems.

Standard 1

General

Standard 2

Inspect and adjust generator drive belts; replace as needed.

Standard 3

Inspect and test voltage regulator; replace as needed.

Standard 4

Remove, inspect, and replace/reinstall generator.

Standard 5

Disassemble, clean, inspect, and test generator components; replace as needed.

Performance Skill

Understand, identify, and properly diagnose and repair charging systems.

- Inspect and adjust generator drive belts; replace as needed.
- Inspect and test voltage regulator; replace as needed.
- Remove, inspect, and replace/reinstall generator.
- Disassemble, clean, inspect, and test generator components; replace as needed.

STRAND 5

Students will be able to understand, identify, and properly diagnose and repair lighting systems.

Standard 1

Diagnose the cause of brighter than normal, intermittent, dim, or no light operation.

Standard 2

Inspect, replace, and aim headlights and bulbs.

Standard 3

Inspect, diagnose, and test the cause of no turn signal or hazard light operation or lights with no flash on one or both sides; repair or replace as needed.

Performance Skill

Understand, identify, and properly diagnose and repair lighting systems.

- Diagnose the cause of brighter than normal, intermittent, dim, or no light operation.
- Inspect, replace, and aim headlights and bulbs.
- Inspect, diagnose, and test the cause of no turn signal or hazard light operation or lights with no flash on one or both sides; repair or replace as needed.

STRAND 6

Students will be able to understand, identify, and properly diagnose repair gauges, warning devices, and driver information systems.

Standard 1

Diagnose the cause of intermittent, high, low, or no gauge readings.

Standard 2

Test gauge circuit voltage regulators (limiters); replace as needed.

Standard 3

Inspect and test gauges and gauge sending units; replace as needed.

Standard 4

Inspect and test connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.

Standard 5

Diagnose the cause of constant, intermittent, or no warning light and driver information system operation.

Standard 6

Diagnose the cause(s) of intermittent, high, low, or no readings on Electronic Digital Instrument Clusters.

Standard 7

Inspect and test sensors, sending units, connectors, and wires of electronic digital instrument circuits; repair or replace as needed.

Performance Skill

Understand, identify, and properly diagnose repair gauges, warning devices, and driver information systems.

- Diagnose the cause of intermittent, high, low, or no gauge readings.
- Test gauge circuit voltage regulators (limiters); replace as needed.
- Inspect and test gauges and gauge sending units; replace as needed.
- Inspect and test connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.
- Diagnose the cause of constant, intermittent, or no warning light and driver information system operation.
- Diagnose the cause(s) of intermittent, high, low, or no readings on Electronic Digital Instrument Clusters.
- Inspect and test sensors, sending units, connectors, and wires of electronic digital instrument circuits; repair or replace as needed.

STRAND 7

Students will be able to understand, identify, and properly diagnose and repair horn and wiper/washer.

Standard 1

Diagnose the cause of constant, intermittent, or no horn(s) operation; repair as needed.

Standard 2

Diagnose the cause of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and park problems; repair or replace as needed.

Standard 3

Diagnose the cause of constant, intermittent, or no windshield washer operation; repair as needed.

Performance Skill

Understand, identify, and properly diagnose and repair horn and wiper/washer.

- Diagnose the cause of constant, intermittent, or no horn(s) operation; repair as needed.
- Diagnose the cause of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and park problems; repair or replace as needed.
- Diagnose the cause of constant, intermittent, or no windshield washer operation; repair as needed.

STRAND 8

Students will be able to understand, identify, and properly diagnose and repair accessories.

Standard 1

Diagnose the cause of slow, intermittent, or no operation of motor-driven accessory circuits; repair as needed.

Standard 2

Diagnose the cause of poor, intermittent, or no heated glass operation; repair as needed.

Standard 3

Diagnose the cause of poor, intermittent, or no electric door and hatch/trunk lock operation; repair as needed.

Standard 4

Diagnose the cause of unregulated, intermittent, or no operation of cruise control systems; repair as needed.

Standard 5

Diagnose the cause(s) of the Supplemental Restraint System (SRS) warning light staying on or flashing; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.)

Performance Skill

Understand, identify, and properly diagnose and repair accessories.

- Diagnose the cause of slow, intermittent, or no operation of motor-driven accessory circuits; repair as needed.

- Diagnose the cause of poor, intermittent, or no heated glass operation; repair as needed.
- Diagnose the cause of poor, intermittent, or no electric door and hatch/trunk lock operation; repair as needed.
- Diagnose the cause of unregulated, intermittent, or no operation of cruise control systems; repair as needed.
- Diagnose the cause(s) of the Supplemental Restraint System (SRS) warning light staying on or flashing; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.)

STRAND 9

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

Standard 1

Understand and demonstrate reliability.

- Determine individual time management skills.
- Explore what's ethical in the workplace or school.
- Demonstrate awareness of government.
- Demonstrate awareness of professional organizations and trade unions.

Standard 2

Understand and demonstrate responsiveness.

- Define the customer.
- Recognize benefits of doing a community service project.
- Demonstrate social etiquette.
- Identify customer expectations.

Standard 3

Understand resiliency.

- Discover self-motivation techniques and establish short-term goals.
- Select characters of a positive image.
- Identify a mentor.

Standard 4

Understand and demonstrate workplace habits.

- Participate in a shadowing activity.
- Explore workplace ethics: codes of conduct.
- Recognize safety issues.
- Perform a skill demonstration.
- Exercise your right to know.

Standard 5

Understand and develop initiative.

- Develop personal financial skills.
- Develop a business plan.
- Investigate entrepreneurship opportunities.

Standard 6

Understand and demonstrate continuous improvement.

- Conduct a worker interview.
- Demonstrate evaluation skills.
- Examine ethics and values in the workplace.
- Develop a working relationship with a mentor.
- Construct a job search network.

STRAND 10

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 3.

Standard 1

Understand and develop collaboration skills.

- Develop a working relationship with a mentor.
- Apply supervisory skills.
- Manage a project and evaluate others.

Standard 2

Understand and demonstrate change management skills.

- Evaluate your career and training goals.
- Identify and apply conflict resolution skills.
- Illustrate an organizational structure.
- Plan and implement a leadership project.

Standard 3

Understand how customer service applies to the workplace.

- Serve as a volunteer in the community.
- Examine workplace ethics: the role of values in making decisions.
- Understand the cost of customer service.
- Develop customer service skills.
- Maximize customer service skills.

Standard 4

Understand and demonstrate career readiness.

- Market your career choice.
- Research resume writing.
- Demonstrate interviewing skills.
- Predict employment trends.
- Re-evaluate career goals and establish long-term goals.
- Construct a job search network.
- Evaluate professional competencies.
- Analyze your entry-level job skills.
- Design and present a lesson plan on an aspect of your career choice.
- Write an article for a professional journal in your career area.
- Refine your employment portfolio.