BAKER COLLEGE
STUDENT LEARNING OUTCOMES

AST 1410A Electrical/Electronic Systems I
4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Demonstrate general electrical system diagnosis techniques.
    a. Research vehicle service information including vehicle service history, service precautions, and technical service bulletins. P-1
    b. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law). P-1
    c. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance. P-1
    d. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits. P-1
    e. Demonstrate proper use of a test light on an electrical circuit. P-1
    f. Use fused jumper wires to check operation of electrical circuits. P-1
    g. Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems. P-1
    h. Inspect and test fusible links, circuit breakers, and fuses; determine needed action. P-1
    i. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action. P-1

2. Demonstrate battery diagnosis and service techniques.
    a. Perform battery state-of-charge test; determine needed action. P-1
    b. Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine needed action. P-1
    c. Maintain or restore electronic memory functions. P-1
    d. Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. P-1

e. Perform slow/fast battery charge according to manufacturer's recommendations. P-1
f. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply. P-1
g. Identify safety precautions for high voltage systems on electric, hybrid, hybrid-electric, and diesel vehicles. P-2
h. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery. P-1
i. Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures. P-2

3. Demonstrate starting system diagnosis and repair techniques.
    a. Perform starter current draw tests; determine needed action. P-1
    b. Perform starter circuit voltage drop tests; determine needed action. P-1
    c. Inspect and test starter relays and solenoids; determine needed action. P-2
    d. Remove and install starter in a vehicle. P-1
    e. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action. P-2
    f. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition. P-2

4. Apply charging system diagnosis and repair techniques
    a. Perform charging system output test; determine needed action. P-1
    b. Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions. P-1
    c. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment. P-1
    d. Remove, inspect, and/or replace generator (alternator). P-1
    e. Perform charging circuit voltage drop tests; determine needed action. P-1

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

These SLOs are not approved for experiential credit.

Effective: Fall 2018