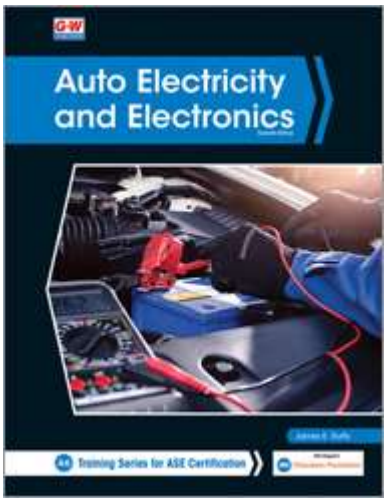
Correlation of
***Auto Electricity and Electronics,* Duffy**
(Goodheart-Willcox Publisher ©2021)
to the
2022 ASE Education Foundation Master Automobile Service Technology (MAST) Task List

The following chart correlates the *Auto Electricity and Electronics* textbook and shop manual (©2021) to the 2022 ASE Education Foundation Master Automobile Service Technology (MAST) Task List.

The correlation below lists the ASE Education Foundation Master Automobile Service Technology Tasks, priority levels, corresponding page numbers from the *Auto Electricity and Electronics* textbook, and corresponding job numbers from the *Auto Electricity and Electronics Shop Manual*.

For more information on the ASE Education Foundation standards, please visit www.aseeducationfoundation.org.



ELECTRICAL/ELECTRONIC SYSTEMS

For every task in Electrical/Electronic Systems, the following safety requirement must be strictly enforced:

- 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.

Task Number and Description	Priority	G-W Content
VI. ELECTRICAL/ELECTRONIC SYSTEMS **A. General**		
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including vehicles equipped with advanced driver assistance systems (ADAS).	P-1	Textbook: pg. 140–162 Shop Manual: Jobs 2, 3

Task Number and Description	Priority	G-W Content
2. Identify electrical/electronic system components and configurations.	P-1	Textbook: pg. 19–32, 58–76, 82–100, 118–123, 246–255, 260–268, 272–293, 298–326, 330–354, 358–365, 368–382, 386–393, 398–415, 418–434 Shop Manual: Jobs 7, 8, 11, 12, 16, 19, 21, 23, 24, 25, 27, 28, 29, 30, 35, 36, 37, 38
3. Retrieve and record DTCs, OBD monitor status, and freeze frame data; clear codes and data when directed.	P-1	Textbook: pg. 21, 108, 443-450, 462, 476-480 Shop Manual: Job 4, 29
4. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	P-1	Textbook: pg. 46–54 Shop Manual: Jobs 12, 16, 19, 21, 223, 24, 25, 27, 28, 29, 30, 35, 36, 37, 38
5. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1	Textbook: pg. 175–181 Shop Manual: Jobs 6, 12, 16, 20, 21, 23, 24, 27, 28, 29, 30, 35, 36, 37, 38
6. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1	Textbook: pg. 169–172 Shop Manual: Jobs 6, 12, 16, 19, 20, 21, 23, 31, 32, 35
7. Describe types of test lights; use appropriate test light to check operation of electrical circuits per service information.	P-1	Textbook: pg. 172–174 Shop Manual: Jobs 12, 20, 21, 30, 31, 32, 35
8. Use fused jumper wires to check operation of electrical circuits per service information.	P-1	Textbook: pg. 172 Shop Manual: Jobs 6, 23
9. Use wiring diagrams during the diagnosis of electrical/electronic circuit problems.	P-1	Textbook: pg. 148–161 Shop Manual: Jobs 12, 16, 20, 21, 23, 24, 27, 28, 29, 30, 35, 36, 37, 38
10. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1	Textbook: pg. 492 Shop Manual: Job 6
11. Inspect and test fusible links, circuit breakers, and fuses; determine needed action.	P-1	Textbook: pg. 64–67, 183 Shop Manual: Jobs 6, 7, 12, 16, 23, 24
12. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1	Textbook: pg. 124-134 Shop Manual: Jobs 7, 12, 13, 14, 18, 22, 26, 27, 36
13. Test and measure circuit using an oscilloscope and/or graphing multimeter (GMM); interpret results; determine needed action.	P-1	Textbook: pg. 110-111, 524-525, 666-674 Shop Manual: Jobs 8, 12, 16, 19, 20

Task Number and Description	Priority	G-W Content
VI. ELECTRICAL/ELECTRONIC SYSTEMS **B. Battery (Conventional 12-volt)**		
1. Perform battery state-of-charge test; determine needed action.	P-1	Textbook: pg. 112, 486-489 Shop Manual: Job 8, 9
2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test; determine needed action.	P-1	Textbook: pg. 241-243, 489–491 Shop Manual: Jobs 8, 12
3. Maintain or restore electronic memory functions as recommended by manufacturer.	P-2	Textbook: pg. 477 Shop Manual: Job 9
4. Inspect and clean battery; fill battery cells (if applicable); check battery cables, connectors, clamps, and hold-downs.	P-1	Textbook: pg. 237-238, 485–488, 495-496 Shop Manual: Jobs 8, 9
5. Perform battery charging according to manufacturer's recommendations.	P-1	Textbook: pg. 492 Shop Manual: Job 9
6. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.	P-1	Textbook: pg. 493 Shop Manual: Job 10
7. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.	P-2	Textbook: pg. 477, 493 Shop Manual: Job 9
VI. ELECTRICAL/ELECTRONIC SYSTEMS **C. Starting System**		
1. Perform starter current draw tests; determine needed action.	P-1	Textbook: pg. 494–495 Shop Manual: Jobs 8, 12
2. Perform starter circuit voltage drop tests; determine needed action.	P-1	Textbook: pg. 495 Shop Manual: Jobs 8, 12
3. Inspect and test starter relays and solenoids; determine needed action.	P-2	Textbook: pg. 496–497 Shop Manual: Jobs 12, 13
4. Remove and install starter in a vehicle.	P-1	Textbook: pg. 498–499, 504 Shop Manual: Job 15
5. Inspect test switches, connectors, and wires of starter control circuits; determine needed action.	P-1	Textbook: pg. 496–498 Shop Manual: Jobs 12, 14
6. Demonstrate knowledge of an automatic idle-stop/start-stop system.	P-1	Textbook: pg. 422
7. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-1	Textbook: pg. 494 Shop Manual: Job 12
8. Diagnose a no-crank condition using a wiring diagram and test equipment; determine needed action.	P-1	Textbook: pg. 148-161, 497-498 Shop Manual: Jobs 3, 12

Task Number and Description	Priority	G-W Content
VI. ELECTRICAL/ELECTRONIC SYSTEMS **D. Charging System**		
1. Perform charging system output test; determine needed action.	P-1	Textbook: pg. 511 Shop Manual: Job 16
2. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment; determine needed action.	P-1	Textbook: pg. 263, 508, 518 Shop Manual: Jobs 16, 17
3. Remove, inspect, and/or replace generator (alternator); determine needed action.	P-1	Textbook: pg. 512–519 Shop Manual: Job 18
4. Perform charging circuit voltage drop tests; determine needed action.	P-1	Textbook: pg. 509–511 Shop Manual: Job 16
5. Diagnose charging system for causes of undercharge, no-charge, or overcharge conditions; determine needed action.	P-1	Textbook: pg.509-511 Shop Manual: Jobs 16, 17
VI. ELECTRICAL/ELECTRONIC SYSTEMS **E. Lighting Systems**		
1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); determine needed action.	P-1	Textbook: pg. 565–570 Shop Manual: Job 21
2. Aim headlights.	P-2	Textbook: pg. 566–567 Shop Manual: Job 22
3. Diagnose the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1	Textbook: pg. 564-565 Shop Manual: Job 21
VI. ELECTRICAL/ELECTRONIC SYSTEMS **F. Instrument Cluster and Driver Information Systems**		
1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.	P-1	Textbook: pg. 572–575 Shop Manual: Jobs 21, 23, 24, 25, 26
2. Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action.	P-1	Textbook: pg. 340-343, 573-575 Shop Manual: Jobs 23, 24, 25, 26
3. Diagnose the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-1	Textbook: pg. 572-575 Shop Manual: Jobs 23, 24, 25, 29
VI. ELECTRICAL/ELECTRONIC SYSTEMS **G. Body Electrical System**		
1. Diagnose vehicle comfort, convenience, access, safety, and related systems operation; determine needed action.	P-2	Textbook: pg. 368-382 Shop Manual: Jobs 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38

Task Number and Description	Priority	G-W Content
2. Remove and reinstall door panel.	P-1	Textbook: pg. 587–589 Shop Manual: Job 33
3. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed action.	P-1	Textbook: pg. 371–373 Shop Manual: Job 38
4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.	P-1	Textbook: pg. 614–622 Shop Manual: Job 5
5. Verify windshield wiper and washer operation; replace wiper blades.	P-1	Textbook: pg. 358-363 Shop Manual: Job 28
6. Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed action.	P-2	Textbook: pg. 378-382 Shop Manual: Job 35
7. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, parking assist, and back-up camera); determine needed action.	P-1	Textbook: pg. 358-364, 611-621 Shop Manual: Jobs 5, 27, 28, 29, 30, 34
8. Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-1	Textbook: pg. 443-456, 663-666 Shop Manual: Jobs 4, 29, 30
9. Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-1	Textbook: pg. 226, 477-478 Shop Manual: Jobs 4, 29, 30