

Florida Department of Education
Curriculum Framework

Program Title: Automotive Maintenance and Light Repair
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Secondary – Career Preparatory

Program Number	9504100
CIP Number	0647060417
Grade Level	9-12
Standard Length	6 credits
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3023 – Automotive Service Technicians and Mechanics
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to broad, transferable skills and stresses understanding and demonstration of the following elements of the Automotive industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is planned sequence of instruction consisting of six credits.

It is **strongly recommended** that the scope, sequence, and course recommendations be followed.

NOTE: For institutions using this framework, the Automotive Service Excellence Education Foundation (ASEEF) highly recommends, at a minimum, the Maintenance and Light Repair (MLR) for program Certification/Accreditation. Florida Statute (F.S.) 1004.925 – Automotive service technology education programs; certification. – requires all automotive service technology education programs shall be industry certified in accordance with rules adopted by the State Board of Education.

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the secondary program structure:

Course Number	Course Title	Teacher Certification	Length	SOC Code	Level	Graduation Requirement
9504110	Automotive Maintenance and Light Repair 1	AUTO IND @7 %7 %G AUTO MECH @7 7G	1 credit	49-3023	3	
9504120	Automotive Maintenance and Light Repair 2		1 credit		3	
9504130	Automotive Maintenance and Light Repair 3		1 credit		3	
9504140	Automotive Maintenance and Light Repair 4		1 credit		3	
9504150	Automotive Maintenance and Light Repair 5		1 credit	49-3023	3	
9504160	Automotive Maintenance and Light Repair 6		1 credit	49-3023	3	

(Graduation Requirement Abbreviations- EQ= Equally Rigorous Science, PA= Practical Arts, EC= Economics)

National Standards

Programs identified as having Industry or National Standards to the corresponding standards and/or benchmarks for the Automotive Maintenance and Light Repair program can be found using the following link: <https://www.aseeducationfoundation.org/program-accreditation>

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.
- 02.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment relating to the automotive industry.
- 03.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.
- 04.0 Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, lubrication and cooling systems.
- 05.0 Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, instrument cluster, driver information, and body electrical systems.
- 06.0 Explain and apply proficiently the diagnosis, service and repair of front and rear suspension systems, wheel alignment, and wheels and tires.
- 07.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, and related (wheel bearings, parking brake, electrical, etc.) systems.
- 08.0 Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, heating, ventilation, and engine cooling, operating and related control systems.
- 09.0 Explain and apply proficiently the diagnosis, service and repair of engine computerized controls, fuel, air induction, exhaust, and emission control systems.
- 10.0 Explain and apply proficiently the diagnosis, service, repair and overhaul of in-vehicle and off-vehicle automatic transmissions/transaxles.
- 11.0 Explain and apply proficiently the diagnosis, service and repair of manual drivetrain, clutches, transmissions/transaxles, drive and half-shafts, universal and constant velocity joints, differential case assemblies, drive axles, four-wheel and all-wheel drive systems.
- 12.0 Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.
- 13.0 Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.
- 14.0 Explain and apply proficiently the diagnosis, service and repair of front and rear suspension and steering systems, wheel alignment diagnosis and adjustment, and wheels and tires.
- 15.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.
- 16.0 Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, heating, ventilation, engine cooling, operating and related control systems, refrigerant recovery, and recycling and handling.
- 17.0 Explain and apply proficiently the diagnosis, service and repair of engines, computerized controls, ignition, fuel, air induction, exhaust, and emission control systems.
- 18.0 Explain and apply proficiently the diagnosis, service, maintenance, repair and overhaul of in-vehicle and off-vehicle automatic transmissions/transaxles.
- 19.0 Explain and apply proficiently the diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, ring and pinion gears, differential case assembly, and drive axles.

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 1
 Course Number: 9504110
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: None
 Recommended Grade Level: 9th/10th
 Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair 1 course prepare students for entry into Automotive Maintenance and Light Repair 2. Students explore career opportunities and requirements of a professional service technician. Content emphasizes beginning transportation service skills and workplace success skills. Students study safety, tools, equipment, shop operations, basic engine fundamentals, and basic technician skills.

For every task in Automotive Maintenance and Light Repair 1, 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.

Abbreviations:

ER = Engine Repair
 ASE = Required Supplemental Tasks

ER Task List:	
P-1 =	12
P-2 =	2
P-3 =	1
Total	15

CTE Standards and Benchmarks		Priority Number
01.0	Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.--The student will be able to:	
01.01	Identify and apply general shop safety rules and procedures, EPA and OSHA standards.	ASE
01.02	Demonstrate knowledge of appropriate automotive industry certifications.	
01.03	Identify and define career opportunities in the automotive service industry.	

CTE Standards and Benchmarks	Priority Number
01.04 Research, identify, and interpret the Federal Law as recorded in (29 CFR-1910.1200).	
01.05 Identify appropriate emergency first aid procedures.	
01.06 Utilize and demonstrate safe procedures for handling of tools and equipment.	ASE
01.07 Identify and use proper placement of floor jacks and jack stands.	ASE
01.08 Identify and use proper procedures for safe lift operation.	ASE
01.09 Utilize proper ventilation procedures for working within the lab/shop area.	ASE
01.10 Identify proper procedures for safe pit usage.	
01.11 Identify marked safety areas.	ASE
01.12 Identify the location and the types of fire extinguishers and other fire safety equipment.	ASE
01.13 Demonstrate knowledge of the procedures for using fire extinguishers and other safety equipment.	ASE
01.14 Identify the location and use of eye wash stations.	ASE
01.15 Identify the location of the posted evacuation routes.	ASE
01.16 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.	ASE
01.17 Identify and wear appropriate clothing for lab/shop activities.	ASE
01.18 Secure hair and jewelry for lab/shop activities.	ASE
01.19 Use proper handling procedures for automotive fluids.	
01.20 Identify and describe typical automotive lubricants and lubricant properties.	
01.21 Identify and describe typical automotive seals and gaskets.	
01.22 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	ASE
01.23 Disable supplemental restraint systems (SRS) in accordance with manufacturers' procedures.	
01.24 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.)	ASE

CTE Standards and Benchmarks	Priority Number
01.25 Locate and demonstrate knowledge of Safety Data Sheets (SDS).	ASE
02.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment relating to the automotive industry.--The student will be able to:	
02.01 Identify tools and equipment and their appropriate usage in automotive applications.	ASE
02.02 Identify and use standard and metric measurement skills and designation.	ASE
02.03 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	ASE
02.04 Demonstrate proper use of precision-measuring tools (i.e. micrometer, digital/dial-indicator, digital/dial caliper) and torque methods.	ASE
03.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.--The student will be able to:	
03.01 Identify information needed and the service requested on a repair order.	ASE
03.02 Identify automobiles according to engine location, cylinders, type of drive system, purpose, etc.	
03.03 Identify purpose and demonstrate proper use of fender covers, floor mats and other vehicle protection equipment.	ASE
03.04 Demonstrate use of the three C's (Concern, Cause, and Correction).	ASE
03.05 Review vehicle service history.	ASE
03.06 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	ASE
03.07 Conduct an appropriate pre-service evaluation and report or note any concerns not already on the repair order.	
03.08 Determine the presence of a Tire Pressure Monitoring System (TPMS).	
03.09 Determine the presence of wheel locks.	
03.10 Determine the presence of an air suspension system.	
03.11 Check operation and status of instrument panel warning lights and gauges.	
03.12 Locate and use Vehicle identification Number (VIN) vehicle information placards, decals, tags, as required.	
03.13 Demonstrate proficiency in manufacturer electronic service information system, including flat rate manuals, technical service bulletins and replacement part identification; where applicable.	
03.14 Use proper chemicals for cleaning and lubrication.	

CTE Standards and Benchmarks	Priority Number
03.15 Reset maintenance indicators as applicable.	
03.16 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).	ASE
03.17 Inspect under-hood area for leaks, damage, and unusual conditions.	
03.18 Determine fluid type requirements and identify fluid.	
03.19 Check engine oil level and condition; service as required.	
03.20 Check engine coolant level and condition; service as required.	
03.21 Check power steering fluid level and condition; service as required.	
03.22 Check brake fluid level and condition; service as required.	
03.23 Check hydraulic clutch fluid and condition; service as required.	
03.24 Check windshield washer fluid level and condition; service as required.	
03.25 Check automatic transmission fluid level and condition; service as required.	
03.26 Inspect undercar area for leaks, damage, and unusual conditions.	
03.27 Check differential/transfer case fluid level; note unusual conditions; service as required.	
03.28 Check manual transmission fluid level; note unusual conditions; service as required.	
03.29 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear.	
03.30 Lubricate driveline, suspension and steering systems as applicable.	
03.31 Inspect cooling system pipes and hoses for wear, damage, and proper routing.	
03.32 Inspect and replace inline fuel filters as applicable.	
03.33 Inspect and replace air filter.	
03.34 Inspect and replace cabin air filter.	
03.35 Inspect, replace and adjust drive belts; inspect tensioners and pulleys.	
03.36 Document observed damage, unusual conditions, and concerns.	

CTE Standards and Benchmarks	Priority Number
03.37 Inspect struts, springs, and related components; service as required.	
03.38 Inspect stabilizer bar, bushings, brackets, and links; service as required.	
03.39 Inspect springs, torsion bars, and related components; service as required.	
03.40 Inspect shock absorbers and related components.	
03.41 Inspect constant velocity (CV) axle shaft boots; service as required.	
03.42 Identify service considerations when equipped with a Tire Pressure Monitoring System (TPMS).	
03.43 Identify nitrogen-filled tires.	
03.44 Inspect tires, diagnose tire wear patterns, inspect spare and mounting system; check and adjust tire pressure; where applicable.	
03.45 Rotate tires according to manufacturer’s recommendations.	
03.46 Balance wheel and tire assembly (static, dynamic and road force balance); where applicable.	
03.47 Dismount, inspect, and remount tire on wheel.	
03.48 Repair tire according to industry standards.	
03.49 Reinstall wheel; torque wheel fasteners to specification.	
03.50 Check wheel bearings for play and other signs of wear.	
03.51 Perform a visual inspection of a brake drum system.	
03.52 Perform a visual inspection of a disc brake system.	
03.53 Check parking brake operation; check parking brake components for unusual conditions.	
03.54 Check wiper blades, inserts, and arms; replace wiper blades or inserts.	
03.55 Lubricate door latches and hinges.	
03.56 Inspect fuel tank, fuel cap and seal; inspect and replace fuel lines, fittings, and hoses; as applicable.	
03.57 Perform slow/fast battery charge.	
03.58 Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.	

CTE Standards and Benchmarks	Priority Number
03.59 Perform battery, starting, and charging system tests using appropriate tester.	
03.60 Start a vehicle using jumper cables or a battery auxiliary power supply (jump box).	
03.61 Maintain or restore electronic memory functions if required.	
03.62 Inspect and replace exterior and courtesy lamps.	
04.0 Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, lubrication and cooling systems.--The student will be able to:	
General	
04.01 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
04.02 Verify operation of the instrument panel engine warning indicators.	P-1
04.03 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.	P-1
04.04 Install engine covers using gaskets, seals and sealers as required.	P-1
04.05 Verify engine mechanical timing.	P-2
04.06 Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.	P-1
04.07 Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.	P-2
04.08 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Cylinder Head and Valve Train	
04.09 Adjust valves (mechanical or hydraulic lifters).	P-3
04.10 Identify components of the cylinder head and valve train.	P-1
Lubrication and Cooling Systems	
04.11 Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine necessary action.	P-1
04.12 Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1
04.13 Remove, inspect, and replace thermostat and gasket/seal.	P-1

CTE Standards and Benchmarks	Priority Number
04.14 Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.	P-1
04.15 Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as require.	P-1
04.16 Identify components of the lubrication and cooling systems.	P-1

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 2
 Course Number: 9504120
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: Automotive Maintenance and Light Repair 1
 Recommended Grade Level: 10th
 Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair 2 course prepare students for entry into Automotive Maintenance and Light Repair 3. Students study automotive general electrical systems, starting and charging systems, batteries, lighting, instrument cluster, driver information, and body electrical systems. Content emphasizes beginning transportation service skills and workplace success skills.

For every task in Automotive Maintenance and Light Repair 2, 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.

Abbreviations:

EE = Electrical/Electronic Systems

EE Task List:	
	P-1 = 26
	P-2 = 10
	P-3 = 2
Total	38

CTE Standards and Benchmarks		Priority Number
05.0	Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, instrument cluster, driver information, and body electrical systems.--The student will be able to:	
General		
05.01	Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	P-1
05.02	Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm’s Law).	P-1

CTE Standards and Benchmarks	Priority Number
05.03 Use wiring diagrams to trace electrical/electronic circuits.	P-1
05.04 Demonstrate proper use of a digital multi-meter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance.	P-1
05.05 Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1
05.06 Use a test light to check operation of electrical circuits.	P-2
05.07 Use fused jumper wires to check operation of electrical circuits.	P-2
05.08 Measure key-off battery drain (parasitic draw).	P-1
05.09 Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.	P-1
05.10 Repair and/or replace connectors, terminal ends, and wiring of electrical/electronic systems (including solder repair)	P-1
05.11 Identify electrical/electronic system components and configuration.	P-1
05.12 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Battery Service	
05.13 Perform battery state-of-charge test; determine necessary action.	P-1
05.14 Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine necessary action.	P-1
05.15 Maintain or restore electronic memory functions.	P-1
05.16 Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.	P-1
05.17 Perform slow/fast battery charge according to manufacturer’s recommendations.	P-1
05.18 Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.	P-1
05.19 Identify safety precautions for high voltage systems on electric, hybrid-electric, and diesel vehicles.	P-2
05.20 Identify electrical/electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting vehicle battery.	P-1
05.21 Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures.	P-2
Starting System	

CTE Standards and Benchmarks	Priority Number
05.22 Perform starter current draw tests; determine necessary action.	P-1
05.23 Perform starter circuit voltage drop tests; determine necessary action.	P-1
05.24 Inspect and test starter relays and solenoids; determine necessary action.	P-2
05.25 Remove and install starter in a vehicle.	P-1
05.26 Inspect and test switches, connectors, and wires of starter control circuits; determine necessary action.	P-2
05.27 Demonstrate knowledge of an automatic idle-stop/start-stop system.	P-3
Charging System	
05.28 Perform charging system output test; determine necessary action.	P-1
05.29 Inspect, adjust, and/or replace generator (alternator) drive belts, check pulleys, and tensioners for wear; check pulley and belt alignment.	P-1
05.30 Remove, inspect, and/or replace generator (alternator).	P-2
05.31 Perform charging circuit voltage drop test; determine necessary action.	P-2
Lighting, Instrument Cluster, Driver Information, and Body Electrical Systems	
05.32 Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.	P-1
05.33 Aim headlights.	P-2
05.34 Identify system voltage and safety precautions associated with high-intensity discharge headlights.	P-2
05.35 Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.	P-1
05.36 Remove and reinstall door panel.	P-1
05.37 Describe the operation of keyless entry/remote-start systems.	P-3
05.38 Verify operation of instrument panel gauges and warning /indicator lights; reset maintenance indicators.	P-1
05.39 Verify windshield wiper and washer operation, replace wiper blades.	P-1

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 3
 Course Number: 9504130
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: Automotive Maintenance and Light Repair 1 & 2
 Recommended Grade Level: 11th
 Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair 3 course prepare students for entry into Automotive Maintenance and Light Repair 4. Students study and service suspension and steering systems, and brake systems. Content emphasizes beginning transportation service skills and workplace success skills.

For every task in Automotive Maintenance and Light Repair 3, 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.

Abbreviations:

SS = Suspension and Steering
 BR = Brakes

SS Task List:	BR Task List:
P-1 = 29	P-1 = 29
P-2 = 6	P-2 = 5
P-3 = 1	P-3 = 3
Total 36	Total 37

CTE Standards and Benchmarks		Priority Number
06.0	Explain and apply proficiently the diagnosis, service and repair of front and rear suspensions systems, wheel alignment, and wheels and tires.--The student will be able to:	
General		
06.01	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
06.02	Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.	P-1

CTE Standards and Benchmarks	Priority Number
06.03 Identify suspension and steering system components and configurations.	P-1
06.04 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Related Suspension and Steering Service	
06.05 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.	P-1
06.06 Inspect power steering fluid level and condition.	P-1
06.07 Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.	P-2
06.08 Inspect for power steering fluid leakage.	P-1
06.09 Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-1
06.10 Inspect and replace power steering hoses and fittings.	P-2
06.11 Inspect pitman arm, relay (center-link/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-1
06.12 Inspect tie rod ends (sockets), tie rod sleeves, and clamps.	P-1
06.13 Inspect upper and lower control arms, bushings, and shafts.	P-1
06.14 Inspect and replace rebound bumpers.	P-1
06.15 Inspect track bar, strut rods/radius arms and related mounts and bushings.	P-1
06.16 Inspect upper and lower ball joints (with or without wear indicators).	P-1
06.17 Inspect suspension system coil springs and spring insulators (silencers).	P-1
06.18 Inspect suspension system torsion bars and mounts.	P-1
06.19 Inspect and/or replace front stabilizer bar (sway bar) bushings, brackets, and links.	P-1
06.20 Inspect, remove, and/or replace strut cartridge or assembly; inspect mounts and bushings.	P-2
06.21 Inspect front strut bearing and mount.	P-1
06.22 Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms.	P-1
06.23 Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings,	P-1

CTE Standards and Benchmarks	Priority Number
center pins/bolts and mounts.	
06.24 Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	P-1
06.25 Inspect electric power steering assist system.	P-2
06.26 Identify hybrid vehicle power steering system electrical circuits and safety precautions.	P-2
06.27 Describe the function of suspension and steering control systems and components, (i.e. active suspension, and stability control).	P-3
06.28 Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action.	
Wheel Alignment	
06.29 Perform pre-alignment inspection; measure vehicle ride height.	P-1
06.30 Describe alignment angles (camber, caster and toe)	P-1
06.31 Identify alignment related symptoms such as wander, drift and pull.	
06.32 Measure front and rear wheel camber; adjust as needed.	
06.33 Measure caster; adjust as needed.	
06.34 Measure front wheel toe; adjust as needed.	
06.35 Center the steering wheel using mechanical methods.	
06.36 Measure rear wheel toe, adjust as needed.	
06.37 Measure thrust angle.	
06.38 Calibrate steering angle sensor.	
Wheels and Tires	
06.39 Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label.	P-1
06.40 Rotate tires according to manufacturer’s recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).	P-1
06.41 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.	P-1

CTE Standards and Benchmarks	Priority Number
06.42 Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.	P-1
06.43 Inspect tire and wheel assembly for air loss; determine necessary action.	P-1
06.44 Repair tire following vehicle manufacturer approved procedure.	P-1
06.45 Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate system; verify operation of instrument panel lamps.	P-1
06.46 Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure.	P-1
07.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, and related (wheel bearings, parking brake, electrical, etc.) systems.--The student will be able to:	
General	
07.01 Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
07.02 Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).	P-1
07.03 Install wheel and torque lug nuts.	P-1
07.04 Identify brake system components and configuration.	P-1
07.05 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Hydraulic System	
07.06 Describe proper brake pedal height, travel, and feel.	P-1
07.07 Check master cylinder for external leaks and proper operation.	P-1
07.08 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports.	P-1
07.09 Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1
07.10 Identify components of hydraulic brake warning light system.	P-3
07.11 Bleed and/or flush brake system.	P-1
07.12 Test brake fluid for contamination.	P-1
07.13 Diagnose pressure concerns in the brake system using hydraulic principles (Pascal’s Law).	

CTE Standards and Benchmarks	Priority Number
Drum Brakes	
07.14 Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-1
07.15 Refinish brake drum and measure final drum diameter; compare with specification.	P-1
07.16 Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-1
07.17 Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-2
07.18 Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments.	P-1
Disc Brakes	
07.19 Remove and clean caliper assembly; inspect for leaks and damage/wear; determine necessary action.	P-1
07.20 Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action.	P-1
07.21 Remove, inspect, and/or replace brake pads and retaining hardware; determine necessary action.	P-1
07.22 Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads and inspect for leaks.	P-1
07.23 Clean and inspect rotor and mounting surface, measure rotor thickness, thickness variation, and lateral runout; determine necessary action.	P-1
07.24 Remove and reinstall/replace rotor.	P-1
07.25 Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-1
07.26 Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-1
07.27 Retract and re-adjust caliper piston on an integral parking brake system.	P-2
07.28 Check brake pad wear indicator; determine necessary action.	P-1
07.29 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendation.	P-1
Power-Assist Units	
07.30 Check brake pedal travel with, and without, engine running to verify proper power booster operation.	P-2
07.31 Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.	P-1

CTE Standards and Benchmarks	Priority Number
Related Systems (Wheel Bearings, Parking Brakes, Electrical, Etc.)	
07.32 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.	P-1
07.33 Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-2
07.34 Check parking brake operation and parking brake indicator light system operation; determine necessary action.	P-1
07.35 Check operation of brake stop light system.	P-1
07.36 Replace wheel bearing and race.	P-2
07.37 Inspect and replace wheel studs.	P-1
Electronic Brakes, Traction Control, and Stability Control Systems	
07.38 Identify traction control/vehicle stability control system components.	P-3
07.39 Describe the operation of a regenerative braking system.	P-3

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 4
 Course Number: 9504140
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: Automotive Maintenance and Light Repair 1, 2, & 3
 Recommended Grade Level: 12th
 Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair IV prepare students for entry into the automotive workforce or into post- secondary training. Student's study and service automotive HVAC systems, engine performance systems, automatic and manual transmission/transaxle systems, as well as practice workplace soft skills.

For every task in Automotive Maintenance and Light Repair 4, 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.

Abbreviations:

HA = Heating and Air Conditioning
 EP = Engine Performance
 AT = Automatic Transmission/Transaxle
 MD = Manual Drive Train and Axles

HA Task List: P-1 = 6 P-2 = 2 P-3 = 0 Total 8	EP Task List: P-1 = 8 P-2 = 7 P-3 = 0 Total 15	AT Task List: P-1 = 6 P-2 = 3 P-3 = 2 Total 11	MD Task List: P-1 = 9 P-2 = 5 P-3 = 1 Total 15
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CTE Standards and Benchmarks	Priority Number
08.0 Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, heating, ventilation, and engine cooling, operating and related control systems.--The student will be able to:	
General	
08.01 Research vehicle service information, including refrigerant/oil type, vehicle service history, service precautions,	P-1

CTE Standards and Benchmarks	Priority Number
and technical service bulletins.	
08.02 Identify heating, ventilation and air conditioning (HVAC) components and configuration.	P-1
08.03 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Refrigeration System Components	
08.04 Inspect and replace A/C compressor drive belts, pulleys, and tensioners; visually inspect A/C components for signs of leaks; determine necessary action.	P-1
08.05 Identify hybrid vehicle A/C system electrical circuits and service/safety precautions.	P-2
08.06 Inspect A/C condenser for airflow restrictions; determine necessary action.	P-1
Heating, Ventilation, and Engine Cooling Systems	
08.07 Inspect engine cooling and heater system hoses and pipes; determine necessary action.	P-1
Operating Systems and Related Controls	
08.08 Inspect A/C-heater ducts, doors, hoses, cabin filters and outlets; determine necessary action.	P-1
08.09 Identify the source of A/C system odors.	P-2
09.0 Explain and apply proficiently the diagnosis, service and repair of engine computerized controls, fuel, air induction, exhaust, and emission control systems.-The student will be able to:	
General	
09.01 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
09.02 Perform engine absolute manifold pressure tests (vacuum/boost); document results.	P-2
09.03 Perform cylinder power balance test; document results.	P-2
09.04 Perform cylinder cranking and running compression tests; document results.	P-2
09.05 Perform cylinder leakage test; document results.	P-2
09.06 Verify engine operating temperature.	P-1
09.07 Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	P-1

CTE Standards and Benchmarks	Priority Number
Computerized Controls	
09.08 Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable.	P-1
09.09 Describe the use of the OBD monitors for repair verification.	P-1
Fuel, Air Induction, and Exhaust Systems	
09.10 Replace fuel filter(s) where applicable.	P-2
09.11 Inspect, service or replace air filters, filter housings, and intake duct work.	P-1
09.12 Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine necessary action.	P-1
09.13 Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine necessary action.	P-1
09.14 Check and refill diesel exhaust fluid (DEF).	P-2
Emissions Control Systems	
09.15 Inspect, test, and service positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform necessary action.	P-2
10.0 Explain and apply proficiently the diagnosis, service, repair and overhaul of in-vehicle and off-vehicle automatic transmissions/transaxles.--The student will be able to:	
General	
10.01 Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
10.02 Check fluid level in a transmission or a transaxle equipped with a dipstick.	P-1
10.03 Check fluid level in a transmission or a transaxle not equipped with a dipstick.	P-1
10.04 Check transmission fluid condition; check for leaks.	P-2
10.05 Identify drive train components and configuration.	P-1
10.06 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
In-Vehicle Transmission/Transaxle	
10.07 Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-2

CTE Standards and Benchmarks	Priority Number
10.08 Inspect for leakage at external seals, gaskets, and bushings.	P-1
10.09 Inspect, replace, and/or align power train mounts.	P-2
10.10 Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1
Off-Vehicle Transmission and Transaxle	
10.11 Describe the operational characteristics of a continuously variable transmission (CVT).	P-3
10.12 Describe the operational characteristics of a hybrid vehicle drive train.	P-3
11.0 Explain and apply proficiently the diagnosis, service and repair of manual drivetrain, clutches, transmissions/transaxles, drive and half-shafts, universal and constant velocity joints, differential case assemblies, drive axles, four-wheel and all-wheel drive systems.--The student will be able to:	
General	
11.01 Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
11.02 Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.	P-1
11.03 Check fluid condition; check for leaks.	P-2
11.04 Identify manual drive train and axle components and configuration.	P-1
11.05 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Clutch	
11.06 Check and adjust clutch master cylinder fluid level; use proper fluid type per manufacturer specification	P-1
11.07 Check for hydraulic system leaks.	P-1
Transmission/Transaxle	
11.08 Describe the operational characteristics of an electronically controlled manual transmission/transaxle.	P-2
Drive Shaft, Half Shafts, Universal and Constant-Velocity (CV) Joints (Front, Rear, All, and Four-wheel drive)	
11.09 Inspect, remove, and/or replace bearings, hubs, and seals.	P-2
11.10 Inspect, service, and/or replace shafts, yokes, boots, and universal/CV joints.	P-2

CTE Standards and Benchmarks	Priority Number
11.11 Inspect locking hubs.	P-3
11.12 Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.	P-2
Differential Case Assembly	
11.13 Clean and inspect differential case; check for leaks; inspect housing vent.	P-1
11.14 Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.	P-1
11.15 Drain and refill differential housing.	P-1
11.16 Inspect and replace drive axle wheel studs.	P-1

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 5
 Course Number: 9504150
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: Automotive Maintenance and Light Repair 1, 2 & 3
 *Students enrolled in Automotive Maintenance and Light Repair 5 should also be enrolled in or have successfully completed Automotive Maintenance and Light Repair 3. Automotive Maintenance and Light Repair 5 expands on tasks highlighted in Automotive Maintenance and Light Repair 1, 2, & 3.

Recommended Grade Level: 11th/12th
 Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair 5 prepare students for entry into the automotive workforce or into post- secondary training. Student's study and service automotive engine repair, electrical/electronic systems, suspension and steering systems, brakes as well as practice workplace soft skills.

For every task in Automotive Maintenance and Light Repair 5 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.

Abbreviations:

ER = Engine Repair
 EE = Electrical/Electronics
 SS = Suspension and Steering
 BR = Brakes

ER Task List: P-1 = 9 P-2 = 6 P-3 = 1 Total 16	EE Task List: P-1 = 5 P-2 = 4 P-3 = 6 Total 15	SS Task List: P-1 = 11 P-2 = 18 P-3 = 9 Total 38	BR Task List: P-1 = 11 P-2 = 3 P-3 = 2 Total 16
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CTE Standards and Benchmarks		Priority Number
12.0	Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.--The student will be able to:	
General: Engine Diagnosis; Removal and Reinstallation (R & R)		
12.01	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	P-1
12.02	Research applicable vehicle and service information, including fluid type, internal engine operation, vehicle service history, service precautions, and technical service bulletins.	P-1
12.03	Inspect, remove and replace engine mounts.	P-2
12.04	Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
12.05	Identify and interpret engine concern; determine necessary action.	
12.06	Locate and interpret vehicle and major component identification numbers.	
12.07	Diagnose engine noises and vibrations; determine necessary action.	
12.08	Diagnose the cause of excessive oil consumption, coolant consumption, unusual engine exhaust color and odor; determine necessary action.	
12.09	Perform engine vacuum tests; determine necessary action.	
12.10	Perform cylinder power balance tests; determine necessary action.	
12.11	Perform cylinder cranking and running compression tests; determine necessary action.	
12.12	Perform cylinder leakage tests; determine necessary action.	
Cylinder Head and Valve Train Diagnosis and Repair		
12.13	Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specification and procedure.	P-1
12.14	Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-1
12.15	Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2
12.16	Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing.	P-1
12.17	Establish camshaft position sensor indexing.	P-1

CTE Standards and Benchmarks	Priority Number
Engine Block Assembly Diagnosis and Repair	
12.18 Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-2
12.19 Remove and replace piston pin; where applicable.	
Lubrication and Cooling Systems Diagnosis and Repair	
12.20 Identify causes of engine overheating.	P-1
12.21 Inspect, remove and replace water pump.	P-2
12.22 Remove and replace radiator.	P-2
12.23 Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action.	P-1
12.24 Perform oil pressure tests; determine needed action.	P-1
12.25 Inspect auxiliary coolers; determine necessary action.	P-3
12.26 Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2
12.27 Inspect and replace engine cooling and heater system hoses.	
13.0 Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.-- The student will be able to:	
General: Electrical System Diagnosis	
13.01 Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems.	P-1
13.02 Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1
13.03 Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1
13.04 Identify and interpret electrical/electronic system concern; determine necessary action.	
13.05 Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.	
Battery Diagnosis and Service	
13.06 Perform battery conductance test; determine necessary action.	

CTE Standards and Benchmarks	Priority Number
Starting System Diagnosis and Repair	
13.07 Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition.	P-2
Charging System Diagnosis and Repair	
13.08 Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions.	P-1
Lighting Systems Diagnosis and Repair	
13.09 Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1
13.10 Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.	
Instrument Cluster and Driver Information Systems Diagnosis and Repair	
13.11 Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action.	P-2
13.12 Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-2
13.13 Reset maintenance indicators as required.	P-2
13.14 Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action.	
Body Electrical Systems Diagnosis and Repair	
13.15 Describe operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, cruise control, and auto dimming headlamps); determine needed repairs.	P-3
13.16 Describe 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 repairs.	P-3
13.17 Describe operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs.	P-3
13.18 Describe operation of safety systems and related circuits (such as: horn, airbags, seat belt pre-tensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back-up camera); determine needed repairs.	P-3
13.19 Describe body electronic systems circuits using a scan tool; check for module communication errors (data bus systems); determine needed action.	P-3
13.20 Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-3

CTE Standards and Benchmarks	Priority Number
13.21 Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.	
13.22 Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action.	
14.0 Explain and apply proficiently the diagnosis, service and repair of front and rear suspension and steering systems, wheel alignment diagnosis and adjustment, and wheels and tires.--The student will be able to:	
General: Suspension and Steering Systems	
14.01 Identify and interpret suspension and steering system concerns; determine needed action.	P-2
Steering Systems Diagnosis and Repair	
14.02 Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).	P-1
14.03 Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action.	P-2
14.04 Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2
14.05 Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2
14.06 Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action.	P-2
14.07 Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.	P-2
14.08 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed.	P-1
14.09 Inspect for power steering fluid leakage; determine needed action.	P-1
14.10 Remove and reinstall power steering pump.	P-2
14.11 Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.	P-2
14.12 Inspect, remove, and/or replace power steering hoses and fittings.	P-2
14.13 Inspect, remove, and/or replace pitman arm, relay (center-link/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-2
14.14 Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps.	P-1
14.15 Identify non-rack and pinion worm bearing preload and sector lash.	
Suspension Systems Diagnosis and Repair	

CTE Standards and Benchmarks	Priority Number
14.16 Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
14.17 Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
14.18 Inspect, remove and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers.	P-3
14.19 Inspect, remove and/or replace strut rods and bushings.	P-3
14.20 Inspect, remove and/or replace upper and/or lower ball joints (with or without wear indicators).	P-2
14.21 Inspect, remove and/or replace steering knuckle assemblies.	P-3
14.22 Inspect, remove and/or replace short and long arm suspension system coil springs and spring insulators.	P-3
14.23 Inspect, remove and/or replace torsion bars and mounts.	P-3
14.24 Inspect, remove and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-3
14.25 Inspect, remove and/or replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.	P-3
14.26 Inspect, remove and/or replace track bar, strut rods/radius arms, and related mounts and bushings.	P-3
Related Suspension and Steering Service	
14.27 Remove, inspect, and service and/or replace front and rear wheel bearings.	P-1
Wheel Alignment Diagnosis, Adjustment, and Repair	
14.28 Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action.	P-1
14.29 Perform pre-alignment inspection; measure vehicle ride height; determine needed action.	P-1
14.30 Prepare vehicle for wheel alignment on alignment machine; perform four-wheel alignment by checking and adjusting front and rear wheel caster, camber; and toe as required; center steering wheel.	P-1
14.31 Check toe-out-on-turns (turning radius); determine needed action.	P-2
14.32 Check steering axis inclination (SAI) and included angle; determine needed action.	P-2
14.33 Check rear wheel thrust angle; determine needed action.	P-1
14.34 Check for front wheel setback; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
14.35 Check front and/or rear cradle (sub-frame) alignment; determine needed action.	P-3
14.36 Reset steering angle sensor	P-2
Wheels and Tires Diagnosis and Repair	
14.37 Diagnose wheel/tire vibration, shimmy, and noise; determine needed action.	P-2
14.38 Measure wheel, tire, axle flange, and hub run out; determine needed action.	P-2
14.39 Diagnose tire pull problems; determine needed action.	P-2
15.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.--The student will be able to:	
General: Brake Systems Diagnosis	
15.01 Identify and interpret brake system concern; determine needed action.	P-1
15.02 Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals).	
Hydraulic System Diagnosis and Repair	
15.03 Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law).	P-1
15.04 Measure brake pedal height, travel, and free play (as applicable); determine needed action.	P-1
15.05 Check master cylinder for internal/external leaks and proper operation; determine needed action.	P-1
15.06 Remove, bench bleed, and reinstall master cylinder.	P-1
15.07 Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.	P-3
15.08 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports; determine needed action.	P-1
15.09 Replace brake lines, hoses, fittings, and supports.	P-2
15.10 Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).	P-2
15.11 Inspect, test, and/or replace components of brake warning light system.	P-3
15.12 Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination	

CTE Standards and Benchmarks	Priority Number
valves.	
Drum Brake Diagnosis and Repair	
15.13 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action.	P-1
15.14 Install wheel, torque lug nuts, and make final checks and adjustments associated with drum brakes.	
Disc Brake Diagnosis and Repair	
15.15 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pulsation concerns; determine needed action.	P-1
15.16 Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.	
15.17 Install wheel, torque lug nuts, and make final checks and adjustments associated with disc brakes.	
Power-Assist Units Diagnosis and Repair	
15.18 Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; determine needed action.	P-1
15.19 Inspect and test hydraulically-assisted power brake system for leaks and proper operation; determine needed action.	P-3
15.20 Measure and adjust master cylinder pushrod length.	P-3
Related Systems (Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair	
15.21 Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.	P-2
15.22 Remove, reinstall, and/or replace sealed wheel bearing assembly.	P-1
Electronic Brake Control Systems: Antilock Brakes (ABS), Traction Control (TCS), and Electronic Stability Control (ESC) Systems Diagnosis and Repair	
15.23 Identify and inspect electronic brake control system components (ABS, TCS, and ESC); determine needed action.	P-1
15.24 Remove and install electronic brake control system electrical/electronic and hydraulic components.	

Florida Department of Education
Student Performance Standards

Course Title: Automotive Maintenance and Light Repair 6
 Course Number: 9504160
 Course Credit: 1

It is strongly recommended that the following scope, sequence, and course recommendations be followed.

Recommended Prerequisite: Automotive Maintenance and Light Repair 1, 2, 3, 4, & 5
 *Students enrolled in Automotive Maintenance and Light Repair 6 should also be enrolled in or have successfully completed Automotive Maintenance and Light Repair 4. Automotive Maintenance and Light Repair 6 expands on tasks highlighted in Automotive Maintenance and Light Repair 4.

Recommended Grade Level: 11th/12th
Recommended Credits: 1

Course Description:

The Automotive Maintenance and Light Repair 6 prepare students for entry into the automotive workforce or into post- secondary training. Student's study and service automotive heating and air conditioning, engine performance, automatic transmission/transaxles, manual drive train and axles, as well as practice workplace soft skills.

For every task in Automotive Maintenance and Light Repair 6 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.

Abbreviations:

HA = Heating and Air Conditioning
 EP = Engine Performance
 AT = Automatic Transmission/Transaxle
 MD = Manual Drivetrain and Axles

HA Task List: P-1 = 12 P-2 = 12 P-3 = 4 Total 28	EP Task List: P-1 = 13 P-2 = 12 P-3 = 7 Total 32	AT Task List: P-1 = 5 P-2 = 6 P-3 = 2 Total 13	MD Task List: P-1 = 11 P-2 = 8 P-3 = 4 Total 23
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CTE Standards and Benchmarks		Priority Number
16.0	Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, heating, ventilation, engine cooling, operating and related control systems, refrigerant recovery, and recycling and handling.--The student will be able to:	
General: A/C System Diagnosis and Repair		
16.01	Identify and interpret heating and air conditioning problems; determine needed action.	P-1
16.02	Performance test A/C system; identify problems.	P-1
16.03	Identify abnormal operating noises in the A/C system; determine needed action.	P-2
16.04	Identify refrigerant type; select and connect proper gauge set/test equipment; record temperature and pressure readings.	P-1
16.05	Leak test A/C system; determine needed action.	P-1
16.06	Inspect condition of refrigerant oil removed from A/C system; determine needed action.	P-2
16.07	Determine recommended oil and oil capacity for system application.	P-1
16.08	Using a scan tool, observe and record related HVAC data and trouble codes.	P-3
16.09	Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.	
Refrigeration System Component Diagnosis and Repair		
16.10	Inspect, remove, and/or replace A/C compressor drive belts, pulleys, and tensioners; visually inspect A/C components for signs of leaks; determine needed action.	P-1
16.11	Inspect, test, service, and/or replace A/C compressor clutch components and/or assembly; check compressor clutch air gap; adjust as needed.	P-2
16.12	Remove, inspect, and reinstall A/C compressor and mountings; determine recommended oil type and quantity.	P-2
16.13	Determine need for an additional A/C system filter; determine needed action.	P-3
16.14	Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; determine needed action.	P-2
16.15	Remove, inspect, and reinstall receiver/drier or accumulator/drier; determine recommended oil type and quantity.	P-2
16.16	Remove, inspect, and install expansion valve or orifice (expansion) tube.	P-1
16.17	Inspect evaporator housing water drain; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
16.18 Determine procedure to remove and reinstall evaporator; determine required oil type and quantity.	P-2
Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair	
16.19 Inspect and test heater control valve(s); determine needed action.	P-2
16.20 Determine procedure to remove, inspect, reinstall, and/or replace heater core.	P-2
16.21 Perform cooling system pressure tests; check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses; perform necessary action.	
16.22 Inspect, test, and replace thermostat and gasket/seal.	
16.23 Determine coolant condition and coolant type for vehicle application; drain and recover coolant.	
16.24 Flush system; refill system with recommended coolant; bleed system.	
16.25 Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action.	
16.26 Inspect and test electric cooling fan, fan control system and circuits; determine necessary action.	
Operating Systems and Related Controls Diagnosis and Repair	
16.27 Inspect and test HVAC system blower motors, resistors, switches, relays, wiring, and protection devices; determine needed action.	P-1
16.28 Diagnose HVAC system clutch control systems; determine needed action.	P-2
16.29 Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine needed action.	P-2
16.30 Inspect and test HVAC system control panel assembly; determine needed action.	P-3
16.31 Inspect and test HVAC system control cables, motors, and linkages; determine needed action.	P-3
16.32 Check operation of automatic or semi-automatic HVAC control systems; determine needed action.	P-2
Refrigerant Recovery, Recycling, and Handling	
16.33 Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards.	P-1
16.34 Identify A/C system refrigerant; test for sealants; recover, evacuate, and charge A/C system; add refrigerant oil as required.	P-1
16.35 Recycle, label, and store refrigerant.	P-1

CTE Standards and Benchmarks		Priority Number
17.0	Explain and apply proficiently the diagnosis, service and repair of engines, computerized controls, ignition, fuel, air induction, exhaust, and emission control systems.--The student will be able to:	
General: Engine Diagnosis		
17.01	Identify and interpret engine performance concerns; determine needed action.	P-1
17.02	Diagnose abnormal engine noise or vibration concerns; determine necessary action.	P-3
17.03	Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine necessary action.	P-2
17.04	Diagnose abnormal engine noises or vibration concerns; determine needed action.	P-3
17.05	Diagnose the cause of excessive oil consumption coolant consumption, unusual exhaust color, odor, and sound; determine needed action.	P-2
17.06	Perform engine absolute manifold pressure tests (vacuum/boost); determine needed action.	P-1
17.07	Perform cylinder power balance test; determine needed action.	P-2
17.08	Perform cylinder cranking and running compression tests; determine needed action.	P-1
17.09	Perform cylinder leakage test; determine needed action.	P-1
17.10	Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine needed action.	P-2
17.11	Verify engine operating temperature; determine needed action.	P-1
17.12	Verify correct camshaft timing including variable valve timing (VVT) systems.	P-1
17.13	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.	
17.14	Demonstrate knowledge of using a 4 or 5 gas analyzer, interpret readings, and determine necessary action.	
17.15	Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action.	
Computerized Controls Diagnosis and Repair		
17.16	Access and use service information to perform step-by-step (troubleshooting) diagnosis.	P-1
17.17	Perform active tests of actuators using a scan tool; determine needed action.	P-2
17.18	Check for module communication (including CAN/BUS systems) errors using a scan tool.	

CTE Standards and Benchmarks	Priority Number
Ignition System Diagnosis and Repair	
17.19 Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns; determine needed action.	P-2
17.20 Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	P-1
17.21 Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed.	P-3
17.22 Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	P-1
17.23 Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action.	
Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair	
17.24 Check fuel for contaminants; determine needed action.	P-2
17.25 Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; determine needed action.	P-1
17.26 Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.	P-2
17.27 Inspect, test and/or replace fuel injectors.	P-2
17.28 Verify idle control operation.	P-1
17.29 Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action.	P-1
17.30 Perform exhaust system back-pressure test; determine needed action.	P-2
Emissions Control Systems Diagnosis and Repair	
17.31 Diagnose oil leaks, emissions, and drive-ability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action.	P-3
17.32 Inspect, test, service and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; determine needed action.	P-2
17.33 Diagnose emissions and drive-ability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) system; determine needed action.	P-3
17.34 Inspect and test electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action.	P-3
17.35 Inspect and test components and hoses of the evaporative emissions control (EVAP) system; determine needed action.	P-1

CTE Standards and Benchmarks		Priority Number
17.36	Diagnose emissions and drive-ability concerns caused by the catalytic converter system; determine needed action.	P-3
17.37	Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action.	P-2
17.38	Inspect and test mechanical components of secondary air injection systems; perform necessary action.	
17.39	Adjust valves on engines with mechanical or hydraulic lifters; as applicable.	
17.40	Remove and replace timing belt; verify correct camshaft timing.	
17.41	Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action.	
17.42	Inspect engine oil and/or filter for condition and determine necessary action.	
17.43	Identify hybrid vehicle internal combustion engine service precautions.	
18.0	Explain and apply proficiently the diagnosis, service, maintenance, repair and overhaul of in-vehicle and off-vehicle automatic transmissions/transaxles.--The student will be able to:	
General: Transmission and Transaxle Diagnosis		
18.01	Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action.	P-1
18.02	Diagnose fluid loss and condition concerns; determine needed action.	P-1
18.03	Demonstrate knowledge of pressure test including transmissions/transaxles equipped with electronic pressure control.	P-3
18.04	Perform stall test; determine needed action.	P-2
18.05	Perform lock-up converter system tests; determine needed action.	P-3
18.06	Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	P-1
18.07	Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.	P-2
18.08	Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).	P-2
In-Vehicle Transmission/Transaxle Maintenance and Repair		
18.09	Inspect for leakage; replace external seals, gaskets, and bushings.	P-2
18.10	Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits including computers,	P-1

CTE Standards and Benchmarks	Priority Number
solenoids, sensors, relays, terminals, connectors, switches, and harnesses; demonstrate understanding of relearn procedure.	
18.11 Diagnose electronic transmission control systems using a scan tool; determine necessary action.	
Off-Vehicle Transmission and Transaxle Repair	
18.12 Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces.	P-2
18.13 Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	P-1
18.14 Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	P-2
18.15 Install and seat torque converter to engage drive/splines.	
18.16 Inspect bands and drums; determine necessary action.	
19.0 Explain and apply proficiently the diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, ring and pinion gears, differential case assembly, and drive axles.--The student will be able to:	
General: Drive Train Diagnosis	
19.01 Identify and interpret drive train concern; determine needed action.	P-1
19.02 Check fluid condition; check for leaks; determine needed action.	P-1
Clutch Diagnosis and Repair	
19.03 Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine needed action.	P-1
19.04 Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine needed action.	P-1
19.05 Inspect and/or replace clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	P-1
19.06 Bleed clutch hydraulic system.	P-1
19.07 Inspect flywheel and ring gear for wear and cracks; determine needed action.	P-1
19.08 Measure flywheel runout and crankshaft end play; determine needed action.	P-2
19.09 Describe the operation and service of a system that uses a dual mass flywheel.	P-3

CTE Standards and Benchmarks	Priority Number
19.10 Remove and reinstall manual transmission/transaxle.	
19.11 Inspect hydraulic clutch slave and master cylinders, lines, and hoses; determine necessary action.	
19.12 Inspect engine block, core plugs, rear main engine oil seal, clutch (bell) housing, transmission/transaxle case mating surfaces, and alignment dowels; determine necessary action.	
Transmission/Transaxle Diagnosis and Repair	
19.13 Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	P-2
19.14 Inspect transmission/transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action.	
19.15 Inspect, replace, and align powertrain mounts.	
19.16 Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces.	
19.17 Remove and replace transaxle final drive.	
19.18 Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs.	
19.19 Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action.	
19.20 Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings.	
19.21 Inspect lubrication devices (oil pump or slingers); perform necessary action.	
19.22 Inspect, test, and replace transmission/transaxle sensors and switches.	
Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair (Front, Rear, All-wheel, Four-wheel drive)	
19.23 Diagnose constant-velocity (CV) joint noise and vibration concerns; determine needed action.	P-1
19.24 Diagnose universal joint noise and vibration concerns; determine needed action.	P-2
19.25 Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.	P-2
19.26 Inspect, service, and replace shaft center support bearings.	
19.27 Diagnose noise and vibration concerns; determine necessary action.	
Drive Axle Diagnosis and Repair	

CTE Standards and Benchmarks	Priority Number
Ring and Pinion Gears and Differential Case Assembly	
19.28 Drain and refill differential case; using proper fluid type per manufacturer specification.	P-1
19.29 Inspect and replace companion flange and/or pinion seal; measure companion flange runout.	P-2
Drive Axles	
19.30 Inspect and replace drive axle wheel studs.	P-1
19.31 Remove and replace drive axle shafts.	P-1
19.32 Inspect and replace drive axle shaft seals, bearings, and retainers.	P-2
19.33 Measure drive axle flange runout and shaft end play; determine needed action.	P-2
19.34 Inspect and reinstall limited slip differential components.	
19.35 Remove and reinstall transfer case.	
Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair	
19.36 Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.	P-3
19.37 Inspect locking hubs; determine needed action(s).	P-3
19.38 Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.	P-3
19.39 Identify concerns related to variations in tire circumference and/or final drive ratios.	P-2

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Florida Standards for English Language Development (ELD)

English language learners communicate for social and instructional purposes within the school setting. ELD.K12.ELL.SI.1

English Language Development (ELD) Standards Special Notes:

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate for social and instructional purposes within the school setting. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: <http://www.cpalms.org/uploads/docs/standards/eld/SI.pdf>. For additional information on the development and implementation of the ELD standards, please contact the Bureau of Student Achievement through Language Acquisition at sala@fldoe.org.

Special Notes

The occupational standards and benchmarks outlined in this secondary program **partially correlate** to the standards and benchmarks of the following postsecondary Automotive Service Technology programs:

- Automotive Service Technology - I470608 (0647060405)
- Automotive Service Technology 1 - T400700 (0647060411)
- Automotive Service Technology 2 - T400800 (0647060412)
- Automotive General Service Technician - T400730 (0647060425)
- Automotive Maintenance and Light Repair Technician - T404100 (0647060422)

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE)) will need modifications to meet their needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular course or a modified course. If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete a Career and Technical Education (CTE) course. The student should work on different competencies and new applications of competencies each year toward completion of the CTE course. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number for eligible students with disabilities.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>