

# Perris Union High School District

## Course of Study

A. COURSE INFORMATION		
<b>Course Title:</b> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">CTE Maintenance &amp; Light Repair I - Auto</div> <input type="checkbox"/> New <input type="checkbox"/> Revised	<b>Subject Area:</b> <input type="checkbox"/> Social Science <input type="checkbox"/> English <input type="checkbox"/> Mathematics <input type="checkbox"/> Laboratory Science <input type="checkbox"/> World Languages <input type="checkbox"/> Visual or Performing Arts <input checked="" type="checkbox"/> College Prep Elective <input type="checkbox"/> Other	<b>Grade Level</b> <input type="checkbox"/> MS <input type="checkbox"/> HS <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 12
<b>If revised previous course name if changed</b> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<b>Is this classified as a Career Technical Education course?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Transcript Course Code/Number:</b> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">108411/412</div> (To be assigned by Educational Services)	<b>Required for Graduation:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Meets UC/CSU Requirements?</b> <input checked="" type="checkbox"/> IN PROGRESS <input type="checkbox"/> No	<b>Credential Required to teach this course:</b> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <i>Designated Subjects: Career Technical Education - Transportation</i>  <u>To be completed by Human Resources only.</u> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="border: 1px solid black; padding: 5px; width: 60%; text-align: center;">             Signature         </div> <div style="border: 1px solid black; padding: 5px; width: 30%; text-align: center;">           2/6/18            Date         </div> </div>	
<b>Was this course <u>previously approved by UC for PUHSD?</u></b> <input type="checkbox"/> Yes <input type="checkbox"/> No (Will be verified by Ed Services)	<b>Meets "Honors" Requirements?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Meets "AP" Requirements?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>Unit Value/Length of Course:</b> <input type="checkbox"/> 0.5 (half year or semester equivalent) <input checked="" type="checkbox"/> 1.0 (one year equivalent) <input type="checkbox"/> 2.0 (two year equivalent) <input type="checkbox"/> Other:	
<b>Submitted by: PUHSD Educational Svcs Site:</b> <b>Date: 02/05/2018</b>		
<b>Approvals</b>	<b>Name/Signature</b>	<b>Date</b>
Director of Curriculum & Instruction		2/6/18
Asst. Superintendent of Educational Services		2/6/18
Governing Board		

### **COURSE OUTLINE**

**Course:** 12698 Maintenance & Light Repair I (Introduction to Automotive Service)

**Articulation:** MSJC AUME 100, RCC AUTO 50

**Academic Credit:**

**Job Title(s):**

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|------------|--|
| O'NET      | JOB TITLE  |
| 49-3093.00 | Tire Repair and Changer                          |
| 49-9098.00 | Helpers for Installation, Maintenance and Repair |
| 49-3092.00 | Recreational Vehicle Service Technician          |
| 41-2022.00 | Parts Sales Person                               |
| 49-9071.00 | Maintenance and Repair Workers, General          |
| 53-7061.00 | Cleaners of Vehicles and Equipment               |

**Course Description:**

Maintenance and Light Repair (MLR) I is the first course in a series of three courses in the Automotive Technology Program. This covers important skills and knowledge for becoming a professional service technician. The course content focuses on Safety Expectations and Recordkeeping, Professional Attitude and Behavior Expectations, Shop and Personal Safety, Safe and Appropriate Tool & Equipment Operations, Basic automotive Service Preparation and Practices, Basic Vehicle Engine Service, Maintenance, Basic Tire and Wheel and Service, and Safe Use of Lift Equipment. MLR I meets the NATEF requirements for instruction covering the eight listed areas: 1) Engineer Repair, 2) Automatic Transmission, 3) Manual Transmissions, 4) Suspension and Steering, 5) Brakes, 6) electrical, 7) Air Conditioning and Heating and 8) Engine Performance.

Maintenance and Light Repair course may be used toward meeting the National Automotive Technician Education Foundation (NATFE) if the facility and program have also earned NATEF Accreditation. Upon completing MRLI, MLR II & MLR III courses students may enter the automotive service industry as an Automotive Service Excellence Certified MLR Technician.

**Hours:**

Classroom	<b>180</b>	Classroom	<b>180</b>
Community Site (CC)	<u>0</u>	Coop VocEd (CVE)	<u>0</u>
<b>Total:</b>	<b>180</b>	<b>Total:</b>	<b>180</b>

**Prerequisites:**

To have the maturity to follow all safety mandates and equipment use.

**Date of Last Revision:** October 18, 2017

**Additional Course Information:**

Suggested CDE Course Code: Transportation Sector - Systems Diagnostics, Service, and Repair (Pathway 221) 8530  
Introduction to Systems Diagnostics, Service, and Repair

Hours		
Class	CC	CVE

## Occupational Competencies

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### 1 INTRODUCTION/ORIENTATION

- A Completes a course orientation.
- B Recognizes sexual harassment as defined by California and Federal Law.
- C Models effective strategies for resolving sexual harassment situations.
- D Evaluates and describes appropriate technology ethics for the workplace.
- E Selects, applies, and differentiates among appropriate tools in technology.
- F Identifies the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers.
- G Adapts to various team roles and workplace responsibilities.
- H Organizes and structures work individually and in teams for effective performance and the attainment of goals.
- I Models leadership, cooperation, collaboration, and effective decision-making skills applied in group or team activities, including student organizations.
- J Demonstrates understanding of the importance of time management to fulfill responsibilities and meet deadlines.
- K Applies appropriate problem-solving strategies and critical thinking skills to work-related issues and tasks.
- L Practices conservation of classroom resources.

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### 2 ETHICS AND LEGAL RESPONSIBILITIES

- A Identifies the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations.
- B Describes the concept and application of ethical and legal behavior consistent with workplace standards.
- C Models personal integrity and ethical behavior in the workplace.
- D Demonstrates how to access, analyze, and implement quality assurance information.
- E Defines ethics and explains the importance of ethical standards.

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### 3 PROBLEM-SOLVING, CRITICAL THINKING, RESPONSIBILITY, AND FLEXIBILITY

- A Applies appropriate problem-solving strategies and critical thinking skills to work-related issues and tasks.
- B Understands the systematic problem-solving models that incorporate input, process, outcome, and feedback components.
- C Uses critical thinking skills to make informed decisions and solve problems.
- D Models the qualities and behaviors that constitute a positive and professional work demeanor.
- E Identifies the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- F Adapts to varied roles and responsibilities.
- G Demonstrates that individual actions can affect the larger community.
- H Understands the importance of time management to fulfill responsibilities.
- I Demonstrates how to apply high-quality craftsmanship to a product or presentation and continually refine and perfect it.

Hours		
Class	CC	CVE

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**4 SHOP AND PERSONAL SAFETY**

- A Identify general shop safety rules and procedures.
- B Identify and use proper placement of floor jacks and jack stands.
- C Demonstrate safe handling and use of appropriate tools.
- D Identify and use proper procedures for safe lift operation.
- E Utilize proper ventilation procedures for working within the lab/shop area.
- F Identify marked safety areas.
- G Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.
- H Identify the location and use of eye wash stations.
- I Identify the location of the posted evacuation routes.
- J Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
- K Identify and wear appropriate clothing for lab/shop activities.
- L Secure hair and jewelry for lab/shop activities.
- M Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.
- N Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID lamps, ignition systems, inject systems, etc.).
- O Locate and demonstrate knowledge of material safety data sheets (MSDS).

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**5 TOOLS AND EQUIPMENT**

- A Identify tools and their usage in automotive applications
- B Identify standards and metric designation.
- C Demonstrate safe handling and use of appropriate tools.
- D Demonstrate proper cleaning, storage, and maintenance of tools and equipment.
- E Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper).

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**6 PREPARING VEHICLE FOR SERVICE**

- A Identify information needed and the service requested on a repair order.
- B Identify purpose and demonstrate proper use of fender covers, mats.

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**7 PREPARING VEHICLE FOR CUSTOMER**

- A Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.)

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**8 ENGINE REPAIR**

- A Research applicable vehicle and service information: vehicle service history, service precautions, and technical service bulletins.
- B Verify operation of the instrument panel, engine warning indicators.
- C Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- D Install engine covers using gaskets, seals, and sealers as required.
- E Remove and replace timing belt; verify correct camshaft timing.
- F Inspect oil and coolant for proper maintenance schedules and contaminants.

Hours		
Class	CC	CVE

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**9 AUTOMATIC TRANSMISSION AND TRANSAXLE**

- A Research applicable vehicle and service information: fluid type, vehicle service history, service precautions, and technical service bulletins.
- B Check fluid level in a transmission or a transaxle equipped with a dip-stick.
- C Check fluid level in a transmission or a transaxle not equipped with a dip-stick.
- D Check transmission fluid condition; check for leaks.

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**10 MANUAL DRIVE TRAIN AND AXLES**

- A Research applicable vehicle and service information: fluid type, vehicle service history, service precautions, and technical service bulletins.
- B Drain and refill manual transmission/transaxle and final drive unit.
- C Check fluid condition; check for leaks.
- D Check and adjust clutch master cylinder fluid level.

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**11 SUSPENSION AND STEERING SYSTEMS**

- A Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- B Disable and enable supplemental restraint system (SRS).
- C Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.
- D Flush, fill, and bleed power steering system.
- E Inspect for power steering fluid leakage; determine necessary action.
- F Remove, inspect, replace, and adjust power steering pump drive belt.
- G Inspect and replace power steering hoses and fittings.

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**12 SUSPENSION AND STEERING, WHEEL ALIGNMENT, WHEELS AND TIRES**

- A Perform pre-alignment inspection and measure vehicle ride height; determine necessary action.
- B Inspect tire conditions, identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary actions.
- C Rotate tires according to manufacturer's recommendations.

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**13 BRAKES**

- A Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- B Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).
- C Install wheel and torque lug nuts.
- D Measure brake pedal height, travel, and free play (as applicable); determine necessary action.
- E Check master cylinder for external leaks and proper operation.
- F Inspect brake lines, flexible hoses, and fitting for leaks, dents, kinks, rust, cracks, bulging, wear, loose fittings and supports; determine necessary action.
- G Select, handle, store, and fill brake warning light system.
- H Identify components of brake warning light system.
- I Test brake fluid for contamination.
- J Identify ABS components.

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**14 BRAKES, MISCELLANEOUS**

- A Check brake pedal travel with, and without, engine running to verify proper power booster operation.
- B Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
- C Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.

Hours		
Class	CC	CVE

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**15 ELECTRICAL/ELECTRONIC SYSTEMS, GENERAL AND BATTERY SERVICE**

- A Research applicable vehicle and service information: vehicle service history, service precautions, and technical service bulletins.
- B Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).
- C Use wiring diagrams to trace electrical/electronic circuits.
- D Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance.
- E Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
- F Check operation of electrical circuits with a test light.
- G Perform battery state of charge test and determine necessary action.
- H Perform battery charge task.
- I Start an engine using an auxillary battery.

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**16 ELECTRICAL/ELECTRONIC SYSTEMS, STARTING, CHARGING SYSTEM AND ACCESSORIES**

- A Perform starter current draw test; determine necessary action.
- B Perform starter circuit voltage drop tests; determine necessary action.
- C Inspect and test starter relays and solenoids; determine necessary action.
- D Remove and install starter on a vehicle.
- E Inspect and test switches, connectors, and wires of starter control circuits; determine necessary action.
- F Remove, inspect and install an alternator.

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**17 HEATING AND AIR CONDITIONING, GENERAL**

- A Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- B Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action.
- C Inspect cabin air filter and determine necessary action.
- D Identify components in AC system.
- E Know how to handle and dispose of refrigerants.

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**18 ENGINE PERFORMANCE**

- A Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- B Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action.
- C Perform cylinder power balance test; determine necessary action.
- D Perform cylinder cranking and running compression tests; determine necessary action.
- E Inspect air filter and determine necessary action.
- F Remove, inspect, and replace spark plugs.
- G Identify emission control systems.