Automotive Engine Performance Course Number – 20121

There is a high demand for trained individuals in the automotive service field. The desire for the students to receive industry-based training at the basic level and step up to the higher level of competency in this field is the goal of this course. Completion of this course will aide students as they continue their education at the post-secondary level or in the workforce and in the preparation for their ASE certification.

Student Expectations

Students in this course will be provided detailed information on engines and related systems in a class room environment. They will also have the opportunity to complete hands-on exercises in a lab environment to demonstrate their abilities to identify engine problems and make repairs to those problems. Students will be evaluated by traditional tests, hands-on evaluations and receive daily participation points. The students will have many different guest speakers and attend several field trips throughout the course. Students will be required to complete a summary or questionnaire related to each guest speaker or field trip.

Attendance

Attendance is very important in this class. If students are absent, they will not receive participation points for that day. If the absent is excused, students will be provided the opportunity to make-up the missed work, if requested in a timely manner. Tardiness also has a negative impact on the students, because they will miss critical information about the daily activities. Students that are tardy will result in loss of participation point.

Cell Phones

Cell phones are NOT to be used in the classroom unless permission was granted by the instructor. Any use of cell phones during class, other than times allowed by the instructor, will result in a loss of participation points.

Food and Drink

Food and drinks, besides water, are NOT allowed in the classroom. Any food or drinks in the classroom will result in a loss of participation points.

Grading Scale	Semester Grading
93-100 A	1st Quarter 42.5%
85-92 B	2nd Quarter 42.5%
76-84 C	Semester Test 15%
65-75 D	
0-64 F	

Topics Covered:

- Safety
- Basic engine electrical
- Computerized engine controls
- Ignition systems
- Fuel, air induction and exhaust systems
- Emission control systems
- Career exploration Core Technical Standards & Examples

#1: Demonstrate automotive technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for an automotive repair facility

EP1.1. Demonstrate automotive technology safety practices

- Summarize the proper use of MSDS (material safety data sheet)
- Demonstrate the proper use of hand and power tools
- Examine basic shop safety using OSHA (Occupational Safety Health Administration) standards
- Use protective clothing and safety equipment according to OSHA and EPA requirements
- Maintain a portfolio of successfully completed safety and 1

#2: Properly test, diagnose, and service general engine system

EP2.1. Identify engine performance concerns to determine necessary action.

- Perform a visual inspection of the engine
- Analyze abnormal engine noises
- Analyze abnormal exhaust color and odor Evaluate

EP2.2. Test basic engine systems

- Perform and evaluate a compression test
- Perform and evaluate a cylinder leakage test
- Perform and evaluate tests using scan tools and/or engine analyzer

EP2.3. Research applicable vehicle service information, vehicle history, service precautions, and technical service bulletins.

- Locate and record a vehicle's VIN (Vehicle Identification Number)
- Read and report on technical service bulletins.
- Identify torque specifications, steps, and sequences and apply the necessary formulas for torque extensions • Identify torque yield angles

#3: Properly test, diagnose, and service computerized engine control system

EP3.1. Test engine control systems

- Retrieve and record any OBD I (On Board Diagnostics), OBD II, and OBD III codes
- Obtain and interpret scan tool data
- Inspect related systems 2
- Perform active tests of actuators using scan tool

EP3.2. Service engine control systems

- Access and use service information to perform step-by-step diagnosis, service and repair.

#4: Properly test, diagnose, and service ignition system

EP4.1. Test ignition system

- Perform a visual inspection of the ignition system
- Inspect and test primary and secondary ignition system wiring
- Inspect and test ignition system triggering devices
- Inspect and test ignition coil(s) Apply EP4.2. Service ignition system Examples:
- Check and adjust ignition timing (if possible)
- Remove and replace spark plugs and wires

Indicator #5: Properly test, diagnose, and service fuel, air induction and exhaust system

EP5.1. Test fuel, air induction and exhaust system

- Perform a visual inspection of these systems

- Perform fuel pressure and fuel volume test
- Inspect and test fuel injectors
- Utilize time/volume formula to calculate fuel pump efficiency

EP5.2. Service fuel, air induction and exhaust system

- Replace fuel filter
- Research and graph TPS (throttle position sensor)

#6: Properly test, diagnose, and repair emission and evaporative control system

EP6.1. Test emission and evaporative controls

- Perform visual inspection of the emission and evaporative system and components
- Perform EGR (exhaust gas recirculation) performance test
- Obtain and interpret emissions related trouble codes with scan tool

#7: Students explore career opportunities in the transportation, distribution, and logistics career cluster and develop leadership skills.

EP7.1 Research career opportunities in the transportation, distribution, and logistics fields.

- Utilizing the career exploration, software research and write a report on career opportunities in the TD&L field
- Utilizing the career exploration software, research educational requirements for a chosen career path
- Utilizing career exploration software, update the student's portfolio