



**Hemet High School Automotive
Technology Transportation
Sector
Course Syllabus School Year 2021-2022**

Course Syllabus

Course Title: Automotive Service Technician (AST3A) **Engine Performance**
Term: School Year 2021-2022
Industry Sector: Transportation
Pathway: Automotive Technology

INSTRUCTOR INFORMATION:

Name: Adrian Lallman and Joshua Thomson
Title: ASE Certified Automotive Instructors
Class location: Rooms 840 and 825 Class
Times/Periods: 7:40 am until 2:46
Classroom phone:
Email address: alallman@hemetusd.org
jthomson@hemetusd.org
Web Site (if applicable): <http://www.cte-auto.net>

COURSE DESCRIPTION AND PREREQUISITES

Course Goals and Description: Automotive Service Technician (AST) classes will explore the theory, maintenance, and repair of various automotive vehicle systems. Both theory and practical application will be covered.

Prerequisites: AST 1 is a prerequisite for AST 2, and AST 2 is a prerequisite for AST 3.

COURSE GOALS AND OBJECTIVES (PURPOSE AND LEARNING OUTCOMES)

Engine performance will be explained during this one-year class. This class will integrate the study of math, science, communication skills, and writing skills applicable to the automotive industry throughout the year. If you drive, this class will give you a good understanding of how your car works.

The NATEF standards covered in this course are as follows:

VIII. ENGINE PERFORMANCE

A. General: Engine Diagnosis

1. Identify and interpret engine performance concerns; determine needed action. P-1
2. Research vehicle service information, including vehicle service history, service precautions, and technical service bulletins. P-1
3. Diagnose abnormal engine noises or vibration concerns; determine needed action. P-3
4. Diagnose the cause of excessive oil consumption coolant consumption, unusual exhaust color, odor, and sound; determine needed action. P-2
5. Perform engine absolute manifold pressure tests (vacuum/boost); determine needed action. P-1
6. Perform cylinder power balance test; determine needed action. P-2
7. Perform cylinder cranking and running compression tests; determine needed action. P-1
8. Perform cylinder leakage test; determine needed action. P-1
9. Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine needed action. P-2
10. Verify engine operating temperature; determine needed action. P-1
11. Verify correct camshaft timing including variable valve timing (VVT) systems. P-1

VIII. ENGINE PERFORMANCE

B. Computerized Controls Diagnosis and Repair

1. Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable. P-1

2. Access and use service information to perform step-by-step (troubleshooting) diagnosis. P-1
3. Perform active tests of actuators using a scan tool; determine needed action. P-2
4. Describe the use of OBD monitors for repair verification. P-1

VIII. ENGINE PERFORMANCE

C. Ignition System Diagnosis and Repair

1. 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
2. Inspect and test crankshaft and camshaft position sensor(s); determine needed action. P-1
3. Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed. P-3
4. Remove and replace spark plugs; inspect secondary ignition components for wear and damage. P-1

VIII. ENGINE PERFORMANCE

D. Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair

1. Check fuel for contaminants; determine needed action. P-2
2. Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; determine needed action. P-1
3. Replace fuel filter(s) where applicable. P-2
4. Inspect, service, or replace air filters, filter housings, and intake duct work. P-1
5. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. P-2
6. Inspect, test and/or replace fuel injectors. P-2
7. Verify idle control operation. P-1

8. Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine needed action. P-1
9. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action. P-1
10. Perform exhaust system back-pressure test; determine needed action. P-2
11. Check and refill diesel exhaust fluid (DEF). P-2

VIII. ENGINE PERFORMANCE

E. Emissions Control Systems Diagnosis and Repair

1. Diagnose oil leaks, emissions, and drivability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action. P-3
2. Inspect, test, service and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; determine needed action. P-2
3. Diagnose emissions and drivability 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
4. Inspect and test electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action. P-3
5. Diagnose emissions and drivability concerns caused by the catalytic converter system; determine needed action. P-3
6. Inspect and test components and hoses of the evaporative emissions control (EVAP) system; determine needed action. P-1
7. Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action. P-2

EP Tasks	
P-1	18
P-2	13
P-3	6
	37

TEXTBOOK AND RESOURCES; MATERIALS (REQUIRED & PROVIDED)

Modern Automotive Technology by James Duffy, 7th Edition, and appropriate shop manuals.

LEARNING & TEACHING ENVIRONMENT, METHODS.

Homework policy: Most of the work will be done in class. Some students will work faster than others, so if a written assignment is not completed in class, then it becomes homework and is due the next day. Lab time is very difficult to make up, but students can make arraignments with the instructor for lab make-up. If a student is absent from school the assignment is due the day they return.

Make-up policy: If a student is absent from school, he/she will be given one day for each “excused” day missed to make up the assignment. This is a hands-on class and lab exercises are difficult to make up, students should not miss school, as this puts them at risk of receiving a lower grade than their potential.

Portfolio: (notebook) Students are to keep a portfolio for this class. They will add to this portfolio throughout the school year. All students’ classroom work, lab or shop task sheets, resume, job application, cover letters, letters of recommendation along with other assignments the instructor assigns will be keep in this portfolio. This work will be collected throughout the year, graded, and kept in a student file. It is important the student keep this up to date and well organized to receive credit for all work he/she has completed. This is a large percentage of the student’s final grade; if they fail to turn in the portfolio the student will not pass this class.

(this syllabus is subject to change)

ASSESSMENT, EVALUATION AND GRADING POLICY

Grading Policy: Students earn their grade by the total amount of points they receive on all assignments in the class. Each assignment, (written, shop task, participation, or test) is assigned points. If the student fails to turn in an assignment, they receive a zero for that assignment which negatively impacts their grade. “TURN IN ALL WORK”.

Each student earns 4 points a day for their participation during class. If they are not present, violate classroom/shop rules, or tardy they will lose all the participation points for that day.

The percentage of the total amount of points will determine the grade they will receive.

A=90% B=80% C=70% D=60% 59% and below is an F grade. Some extra credit may be given during the school year, but it should not be assumed.

CODE OF CONDUCT/EXPECTATIONS/BEHAVIOR/PROTOCOL/ROUTINES

Class Rules:

- Student will report to class on time and be in his / her assigned seat before the tardy bell.
- Students with more than 5 tardys, 5 unexcused absences, or one or more truanicies per grading period will not be eligible for an “A” grade for that grading period (B+ max).
- No cellphones or earbuds allowed in class or shop at any time!
- Student will act in a safe manner at all times.
- Student will respect others at all times.
- Student must wear eye protection and closed toed footwear while in shop.
- Student will use computers in an appropriate manner for automotive use only.
- Student will use appropriate language at all times.
- Ask Instructor BEFORE working on any car!
- Student must have a valid driver’s license and back-up assistant to move vehicle!
- No food in class room or shop.
- Do not leave class early! • Do not enter shop without instructor’s explicit permission.
- No talking while instructor is talking.
- No sitting in or sitting/leaning on shop cars.
- Appropriate use of tools and equipment ONLY!
- No horseplay permitted in classroom or shop.
- Theft, vandalism, intentional damaging tools-equipment-vehicles or driving vehicle without license is cause for permanent removal from class, an “F” grade for the semester, and possible legal action.

Discipline Matrix:

Level 1 offence: Verbal warning and documentation

Level 2 offence: Lunch detention(s), contact home, and documentation

Level 3 offence: Suspension from class, contact home, and documentation
Level 4 offence: Expulsion from class, contact home, and documentation

CERTAIN VIOLATIONS MAY RESULT IN IMMEDIATE SUSPENSION OR TERMINATION FROM THE CLASS OR PROGRAM.

“STATEMENTS” EXAMPLE: NETIQUETTE, THEFT, ATTENDANCE, ACADEMIC HONESTY AND OTHER “NO TOLERANCE” ISSUES AND THEIR CONSEQUENCES.

Division of Student Programs and Services

Career Technical Education

No Tolerance Issues

All school site campus rules and district policies will be followed in this classroom. Prohibited student conduct includes, but is not limited to, (RCOE Board Policy 5131):

- Conduct that endangers students, staff, or others. • Conduct that disrupts the orderly classroom or school environment.
- Harassment or bullying of students or staff, including, but not limited to, bullying, cyberbullying, intimidation, hazing or initiation activity, extortion, or any other verbal, written, or physical conduct that causes or threatens to cause violence, bodily harm, emotional suffering or substantial disruption, in accordance with the section entitled “Bullying/Cyberbullying” below.
- Cyberbullying includes the transmission of communications, posting of harassing messages, direct threats, or other harmful texts, sounds, or images on the internet, social networking sites, or other digital technologies using a telephone, computer, or any wireless communication device. Cyberbullying also includes breaking into another person’s electronic account and assuming that person’s identity in order to damage that person’s reputation, or to cause damage to or theft of property belonging to students, staff, or the Riverside County Office of Education.
- Possession or use of a laser pointer, unless used for a valid instructional or other school-related purpose, including employment (Penal Code 417.27)
- Prior to bringing a laser pointer on school premises, students shall first obtain permission from the site administrator or designee. The site administrator or designee shall determine whether the requested use of the laser pointer is for a valid instructional or other school related purpose.
- Use of profane, vulgar, or abusive language.
- Failure to remain on school premises in accordance with school rules.
- Possession, use, or being under the influence of tobacco, alcohol, or other prohibited substances.

Students who violate Riverside County Office of Education or school site rules and regulations may be subject to discipline including, but not limited to, suspension, expulsion, transfer to alternative programs or denial of the privilege of participation in extra-curricular or co-curricular activities in accordance with Riverside County Office of Education policy and administrative regulation. In addition, when the conduct involves intimidation, harassment, or other endangerment of a student or employee, the Superintendent or designee shall provide appropriate assistance as necessary for the victim and the offender, or make appropriate referrals for such assistance. The Riverside County Office of Education Superintendent or designee shall notify local law enforcement as appropriate.

Students may also be subject to discipline, in accordance with law, Riverside County Office of Education policy, or administrative regulation for any off-campus conduct during non-school hours which poses a threat or danger to the safety of students, staff, or Riverside County Office of Education property, or substantially disrupts school activities.

Accommodations: If you are in need of an accommodation in order to participate in this class, please notify the instructor as soon as possible.

Online Course Student Conduct: Student must adhere to all behavioral guidelines mandated by the school site campus and CTE. Students are required to follow internet policies and protocols for the school site, district and Riverside County Office of Education. Behavioral problems (in class or online) can result in being dropped from this class with no credit earned, or in receiving a failing grade for the term (as determined by the instructor). All policies for academic honesty are enforced in the online environment. All course mid-term exams or final exams will be given during class time only.

No Tolerance Issues Signature of Receipt and Understanding

I have read the information contained in this addendum to the course syllabus and understand the expectations contained herein: Student

Name: _____

Student Signature: _____

Date: _____ Parent/Guardian Name: _____

Parent/Guardian Signature: _____ Date: _____

FORM NO. 5357T-E (Revised 06/19)
Division of Student Programs and Services
Career Technical Education

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I have read, understand, and agree to the course requirements and expectations:

Student Signature

Date

Parent Signature

Date

Parent Name: _____

Phone: _____

Email: _____