



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

Course Syllabus

Course Title: Automotive Service Technician (AST2B) **Suspension-Steering**
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 (AST2B) class will explore the theory, maintenance, and repair of automotive suspension, steering, and alignment. Both theory and practical application will be covered.

Prerequisites: AST 1A and AST2A are prerequisites for AST 2B

COURSE GOALS AND OBJECTIVES (PURPOSE AND LEARNING OUTCOMES)

Alignment and suspension-steering 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:

IV. SUSPENSION AND STEERING

A. General: Suspension and Steering Systems

1. Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1
2. Identify and interpret suspension and steering system concerns; determine needed action. P-2

IV. SUSPENSION AND STEERING

B. Steering Systems Diagnosis and Repair

1. Disable and enable supplemental restraint system (SRS); verify indicator lamp operation. P-1
2. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring). P-1
3. Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action. P-2
4. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action. P-2
5. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action. P-2
6. Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action. P-2
7. Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets. P-2
8. Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed. P-1

9. Inspect power steering fluid level and condition. P-1
10. Flush, fill, and bleed power steering system; using proper fluid type per manufacturer specification. P-2
11. Inspect for power steering fluid leakage; determine needed action. P-1
12. Remove, inspect, replace, and/or adjust power steering pump drive belt. P-1
13. Remove and reinstall power steering pump. P-2
14. Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment. P-2
15. Inspect, remove, and/or replace power steering hoses and fittings. P-2
16. Inspect, remove, and/or replace pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper. P-2
17. Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps. P-1
18. Identify hybrid vehicle power steering system electrical circuits and safety precautions. P-2
19. Inspect electric power steering assist system. P-3

IV. SUSPENSION AND STEERING

C. Suspension Systems Diagnosis and Repair

1. Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine needed action. P-1
2. Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine needed action. P-1
3. Inspect, remove and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers. P-3
4. Inspect, remove and/or replace strut rods and bushings. P-3
5. Inspect, remove and/or replace upper and/or lower ball joints (with or without wear indicators). P-2
6. Inspect, remove and/or replace steering knuckle assemblies. P-3

7. Inspect, remove and/or replace short and long arm suspension system coil springs and spring insulators. P-3
8. Inspect, remove and/or replace torsion bars and mounts. P-3
9. Inspect, remove and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links. P-3
10. Inspect, remove and/or replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount. P-3
11. Inspect, remove and/or replace track bar, strut rods/radius arms, and related mounts and bushings. P-3
12. Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts. P-1

IV. SUSPENSION AND STEERING

D. Related Suspension and Steering Service

1. Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings. P-1
2. Remove, inspect, service, and/or replace front and rear wheel bearings. P-1
3. Describe the function of suspension and steering control systems and components, (i.e., active suspension and stability control). P-3

IV. SUSPENSION AND STEERING

E. Wheel Alignment Diagnosis, Adjustment, and Repair

1. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action. P-1
2. Perform pre-alignment inspection; measure vehicle ride height; determine needed action. P-1
3. 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
4. Check toe-out-on-turns (turning radius); determine needed action. P-2
5. Check steering axis inclination (SAI) and included angle; determine needed action. P-2

- 6. Check rear wheel thrust angle; determine needed action. P-1
- 7. Check for front wheel setback; determine needed action. P-2
- 8. Check front and/or rear cradle (sub frame) alignment; determine needed action. P-3
- 9. Reset steering angle sensor P-2

IV. SUSPENSION AND STEERING

F. Wheels and Tires Diagnosis and Repair

- 1. 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
- 2. Diagnose wheel/tire vibration, shimmy, and noise; determine needed action. P-2
- 3. Rotate tires according to manufacturers' recommendation including vehicles equipped with tire pressure monitoring system (TPMS). P-1
- 4. Measure wheel, tire, axle flange, and hub runout; determine needed action. P-2
- 5. Diagnose tire pull problems; determine needed action. P-1
- 6. Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly. P-1
- 7. Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor. P-1
- 8. Inspect tire and wheel assembly for air loss; determine needed action. P-1
- 9. Repair tire following vehicle manufacturer approved procedure. P-1
- 10. Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate system; verify operation of instrument panel lamps. P-1
- 11. Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS), including relearn procedure. P-1

SS Tasks	
P-1	26
P-2	19
P-3	11
	56

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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: _____