



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

Course Syllabus

Course Title: Automotive Service Technician (AST2A) **Brakes**
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 (AST2A) class will explore the theory, maintenance, and repair of various automotive brake systems. Both theory and practical application will be covered.

Prerequisites: AST 1A is a prerequisite for AST 2A.

COURSE GOALS AND OBJECTIVES (PURPOSE AND LEARNING OUTCOMES)

Braking systems 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 Brake standards will be covered in this class. The standards are as follows:

V. BRAKES

A. General: Brake Systems Diagnosis

1. Identify and interpret brake system concerns; determine needed action. P-1
2. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1
3. Describe procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS). P-1
4. Install wheel and torque lug nuts. P-1

V. BRAKES

B. Hydraulic System Diagnosis and Repair

1. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). P-1
2. Measure brake pedal height, travel, and free play (as applicable); determine needed action. P-1
3. Check master cylinder for internal/external leaks and proper operation; determine needed action. P-1
4. Remove, bench bleed, and reinstall master cylinder. P-1
5. Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action. P-3
6. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports; determine needed action. P-1
7. Replace brake lines, hoses, fittings, and supports. P-2
8. Fabricate brake lines using proper material and flaring procedures (double flare and ISO types). P-2

9. Select, handle, store, and fill brake fluids to proper level; **use proper fluid type per manufacturer specification.** P-1
10. Inspect, test, and/or replace components of brake warning light system. P-3
11. Identify components of **hydraulic** brake warning light system. P-2
12. Bleed and/or flush brake system. P-1
13. Test brake fluid for contamination. P-1

V. BRAKES

C. Drum Brake Diagnosis and Repair

1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action. P-1
2. Remove, clean, **and inspect brake drum**; measure brake drum diameter; **determine serviceability.** P-1
3. Refinish brake drum and measure final drum diameter; compare with specification. P-1
4. 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
5. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed. P-2
6. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments. **P-1**

V. BRAKES

D. Disc Brake Diagnosis and Repair

1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action. P-1
2. Remove and clean caliper assembly; inspect for leaks, **damage, and wear**; **determine needed action.** P-1
3. Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action. P-1

4. Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action. P-1
5. Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads; inspect for leaks. P-1
6. Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action. P-1
7. Remove and reinstall/replace rotor. P-1
8. Refinish rotor on vehicle; measure final rotor thickness and compare with specification. P-1
9. Refinish rotor off vehicle; measure final rotor thickness and compare with specification. P-1
10. Retract and re-adjust caliper piston on an integrated parking brake system. P-2
11. Check brake pad wear indicator; determine needed action. P-1
12. Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturers' recommendations. P-1

V. BRAKES

E. Power-Assist Units Diagnosis and Repair

1. Check brake pedal travel with and without engine running to verify proper power booster operation. P-2
2. 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
3. Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; determine needed action. P-1
4. Inspect and test hydraulically-assisted power brake system for leaks and proper operation; determine needed action. P-3
5. Measure and adjust master cylinder pushrod length. P-3

V. BRAKES

F. Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair

- 1. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action. P-2
- 2. Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings. P-2
- 3. Check parking **brake system components** for wear, binding, and corrosion; clean, lubricate, adjust **and/or** replace as needed. P-1
- 4. Check parking brake operation and parking brake indicator light system operation; determine needed action. P-1
- 5. Check operation of brake stop light system. P-1
- 6. Replace wheel bearing and race. P-3
- 7. Inspect and replace wheel studs. P-1
- 8. **Remove, reinstall, and/or replace** sealed wheel bearing assembly. P-1

V. BRAKES

G. Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS) and Electronic Stability Control (ESC) Systems Diagnosis and Repair

- 1. Identify and inspect electronic brake control system components (**ABS, TCS, ESC**); determine needed action. P-1
- 2. Describe the operation of a regenerative braking system. P-3

BR Tasks	
P-1	36
P-2	8
P-3	6
	50

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: _____