



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

Course Syllabus

Course Title: Automotive Service Technician (AST1B) **Electrical**
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 (AST1B) class will explore the theory, maintenance, and repair of the automotive electrical system. Both theory and practical application will be covered.

Prerequisites: AST 1A class is required for AST 1B

COURSE GOALS AND OBJECTIVES (PURPOSE AND LEARNING OUTCOMES)

Electrical system, and some 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 following NATEF standards will be covered:

VI. ELECTRICAL/ELECTRONIC SYSTEMS

A. General: Electrical System Diagnosis

1. Research applicable vehicle and service information **including** vehicle service history, service precautions, and technical service bulletins. P-1
2. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law). P-1
3. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance. P-1
4. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits. P-1
5. **Demonstrate proper use of a test light on an electrical circuit.** P-1
6. **Use fused jumper wires** to check operation of electrical circuits. P-1
7. Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems. P-1
8. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action. P-1
9. Inspect and test fusible links, circuit breakers, and fuses; determine needed action. P-1
10. **Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.** P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

B. Battery Diagnosis and Service

1. Perform battery state-of-charge test; determine needed action. P-1
2. Confirm proper battery capacity for vehicle application; perform battery capacity **and load test**; determine needed action. P-1

3. Maintain or restore electronic memory functions. P-1
4. Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. P-1
5. Perform slow/fast battery charge according to manufacturers' recommendations. P-1
6. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply. P-1
7. Identify safety precautions for high voltage systems on electric, hybrid-electric, and diesel vehicles. P-2
8. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery. P-1
9. Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures. P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS

C. Starting System Diagnosis and Repair

1. Perform starter current draw tests; determine needed action. P-1
2. Perform starter circuit voltage drop tests; determine needed action. P-1
3. Inspect and test starter relays and solenoids; determine needed action. P-2
4. Remove and install starter in a vehicle. P-1
5. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action. P-2
6. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition. P-2
7. Demonstrate knowledge of automatic idle-stop/start-stop system. P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS

D. Charging System Diagnosis and Repair

1. Perform charging system output test; determine needed action. P-1

2. Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions. P-1
3. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment. P-1
4. Remove, inspect, and/or replace generator (alternator). P-1
5. Perform charging circuit voltage drop tests; determine needed action. P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

E. Lighting Systems Diagnosis and Repair

1. Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action. P-1
2. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed. P-1
3. Aim headlights. P-2
4. Identify system voltage and safety precautions associated with high-intensity discharge headlights. P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS

F. Instrument Cluster and Driver Information Systems Diagnosis and Repair

1. Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action. P-2
2. Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action. P-2
3. Reset maintenance indicators as required. P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS

G. Body Electrical Systems Diagnosis and Repair

1. Describe operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, parking assist, cruise control, and auto dimming headlamps); determine needed repairs. P-3
2. Describe operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed repairs. P-3
3. Describe operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs. P-3
4. Describe operation of safety systems and related circuits (such as: horn, airbags, seat belt pre-tensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, parking assist, and back-up camera); determine needed repairs. P-3
5. Demonstrate testing of body electronic system circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action. P-3
6. Describe the process for software transfer, software updates, or reprogramming of electronic modules. P-3

EE Tasks	
P-1	27
P-2	11
P-3	6
	44

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 kept 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: _____