

DE ANZA COLLEGE
APPLIED TECHNOLOGIES DIVISION
Automotive Technology
ELECTRICAL, ENGINE PERFORMANCE AND EMISSIONS PROGRAM

Course Information Sheet Auto 99A

Automotive Electricity, Battery, and Cranking Systems

I. General Information:

Instructor: Pete Vernazza

Office: (408) 864-8216 - Write this number down or enter it in your cell phone

Tool Room: (408) 864-8768.

Email: vernazzapete@fhda.edu

Faculty website: faculty.deanza.edu/vernazzapete

Dept. website: deanza.edu/autotech

All staff and faculty numbers/email at Dept. website

Dates: 09-21-15 through 10-30-15

Days: Monday through Friday

Hours: 7:30 AM to 12:20 PM.

Final Examination Date: 10-30-15.

There will be a multiple choice Final exam every 6 weeks (99A-F)

Cell phone usage is not tolerated in this classroom.

One hundred fifty hours lecture-laboratory per quarter

Automotive electricity including the conventional theory, fundamentals of circuit construction and interpretation, principles of magnetism as applied to electric motors, relays and coils. Diagnosis, troubleshooting and servicing of automotive battery and cranking systems including system repair procedures. Developing skills in the use of test equipment including the DMM and electrical load testing tools for the analysis and diagnosis of these types of electric systems.

Student Learning Outcome - The student will demonstrate the ability to perform a battery load test, a starter draw test, a charging system test and analyze the readings. This is half of your Performance Final which will be given on Finals week in December.

II. Course Objectives:

The student will:

- A. Identify the components of basic automotive electrical systems.
- B. Test automotive electrical systems, including testing and servicing batteries
- C. Use diagnostic equipment to analyze basic automotive electrical systems.
- D. Repair and adjust basic automotive electrical systems to OE specifications.
- E. Demonstrate basic electrical troubleshooting techniques.

III. Essential Student Materials

- A. Laser pointer with extra batteries. You will use this in class all year and I will ask you daily to use it. *Have it on your desk every day at 7:30am. When we are discussing diagrams etc, I will always ask you to point using the laser. Be prepared.
- B. Packet on desk open at 7:30am every day and ready to go. We have a lot to cover this year.
- C. Texts/handouts as listed.
- D. General tool set and Tune-up tool set. ***After week 6, you will not check out ANY tools from the tool room that are on the General Tool Set. Period. Tools need to be purchased by the end of week 6. There will be a tool inspection week 7.**

- E. Approved shop clothing (2 pr. Coveralls), safety shoes, and safety glasses.
- F. Tool chips (10) \$20.00 deposit (see Tool room)
- G. Locker (See Tool room)
- H. Purchase T-Pins

IV. Essential Facilities

Classroom and automotive technology laboratory.

V. Expanded Description: Content and Form

A. Electrical circuits

- 1. Conventional Theory
- 2. Conductive and insulating materials
- 3. Laws of circuitry and calculations
- 4. Electrical symbols and wiring diagrams
- 5. Electrical loads and controls
- 6. Circuit construction and measurement techniques
- 7. Circuit analysis
- 8. Test instruments

B. Developing and using magnetism

- 1. Relays and solenoids
- 2. Motor principles
- 3. Coils and transformers
- 4. Testing and servicing techniques

C. Circuit testing and troubleshooting procedures

- 1. Meter and test-light usage techniques
- 2. Diagnosis using wiring diagrams

D. The storage battery

- 1. Battery construction
- 2. Battery applications, numbering system, and identification techniques
- 3. Safety and handling precautions
- 4. Testing and battery system repair procedures
- 5. Recharging procedures

E. The automotive cranking circuit

- 1. Component identification
- 2. Component operation, test procedures, and specifications
- 3. Disassembly procedures
- 4. Bench testing and installation procedures

F. Circuit Protection

- 1. Fuses
- 2. Circuit breakers
- 3. Fusible links
- 4. Troubleshooting and replacement procedures

G. Switches

- 1. Manual
- 2. Electromagnetic
- 3. Troubleshooting procedures

H. Tools and equipment

- 1. DMM
- 2. Test light
- 3. Logic probe
- 4. Power probe

VI. Assignments

- A. Reading from texts and handouts

- B. Lab assignments per expanded National Automotive Technology Education Foundation (NATEF) task list

VII. Methods of Evaluating Objectives

- A. Problem-solving quizzes covering major lecture topics
- B. Multiple choice final examination, including performance final examination
- C. Lab assignments per NATEF task list
- D. Attendance per department policy

VIII. Texts and Supporting References

Books & packets for the entire year

See my faculty website for ISBN numbers.

IV. Miscellaneous

1. **Choose lab partners carefully.**
2. You will make your own jumpers and test leads for probing connectors. I will supply everything. Once you make them, do NOT ask me for a jumper wire.
Do NOT ever probe a connector **terminal with a test lead or test light!*
**Do NOT ever pierce a wire with a test lead or test light probe!*
3. Who uses email every day? It would be wise to check email every day.
4. Read, read and read. Reading the assigned materials will greatly help your success in this class. If I give you a reading assignment, read it.
We will do a lot of “in-class” reading out-loud. If you do not feel comfortable reading out loud, please see me.
5. If you are going to be a “7:30 to noon student”, you are going to have a long year. What does this mean?

Classroom and Lab Conduct

- A. Students will be dismissed from class for disruptive behavior per college policy
- B. Turn you cell phones off EVERY day and set it on your desk every day. If I see you text messaging in class, I will send you home. Questions? If you feel that you have to use your phone, leave the classroom.
- C. Students will wear safety glasses, coveralls, and work shoes for the duration of labs. Wear coveralls properly.
- D. **Do NOT talk in class while I’m lecturing. It is disrespectful and I will not tolerate it. If you have a question or comment I will be happy to allow you to voice it when I’m done talking.**
- D. **The seating arrangement can and will be changed by me at any time during the school year.**
- E. Students are to remain in assigned areas through clean up.
- F. There is one official 20-minute break between lecture and lab. Additional breaks are at the discretion of the instructor.
- G. **It is expected that work will be completed with pride and craftsmanship. Do NOT leave vehicle components disconnected (i.e. air filter housing, spark plug wires etc.). Each and every day, after completing a task on a stationary engine or vehicle, I want it finished as if you were working on a customer vehicle. That means when you say that the car is finished, it better be absolutely perfect. If something breaks, let me know. Everyone makes mistakes and you are here to learn.**
- H. Sunglasses are NOT permitted in the classroom during lecture or in the lab.
- I. Do NOT play the vehicle radio at any time during lab assignments
- J. **Do NOT move vehicle seats to a reclined position at any time during lab.**

- K. Do NOT leave bottles, cans, wrappers etc. in De Anza vehicles.
- L. **Each day at the end of lab, return vehicle keys to the tool room. I will check keys every day.**
- M. **If a De Anza vehicle has a dead battery, connect low amp charger to the battery at the end of class and leave overnight. Don't ask, just do it.**
- N. Each day at the end of class, neatly tuck in your chairs
- O. **Use fender covers when working under a hood of a vehicle**
- P. **When working on all vehicles (De Anza vehicle or your own), set E-Brake. No exceptions.**

Grading System

90% and higher = A
80% to 89% = B
70% to 79% = C
60% to 69% = D
59% or lower = F

Grading System: Quizzes, comprehensive final, and lab performance final. All tests are open book/notes unless otherwise stated.

Per department policy, a minimum grade of "C" is required.

Grades less than "C" in two courses are cause for dismissal from the Day Program

Attendance Policy

Just as on the job, regular, punctual attendance is required. Always call or email if you are going to be late or absent. The following limits and conditions apply per department policy:

- a. Students must record attendance on a time card. Punch in prior to 7:30 AM (start of class) and out at 12:10 PM (or at end of class). Punch in neatly and orderly.
- b. For each tardy, there is a 1-hour penalty. 7:30AM is tardy.
- c. Forgetting to punch in or out will constitute a 1-hour penalty.
- d. Up to 5 hours (each 6 weeks) can be made up providing the student calls in. Missed time cannot be made up if the student does not call or email prior to class.
- e. Make-up hours must be made-up prior to the day of the final exam.
- f. **Do NOT ever punch in or out for another student. If I find out that you do, you will have the next day off (5 HRS lost without make-up time). Period.**

Hours not made up will be deducted from total class percentage at the rate of 1% per hour. The instructor will specify terms and conditions for make-up.

I understand the classroom conduct, grading and attendance policy and tool requirements per De Anza College Automotive Technology guidelines

Name _____

Signature _____

Date _____

Tear out this sheet and return it to the Instructor

