

Automotive Technology Department

Auto 156 Course Syllabus

Course Information

Course title: Automotive Electrical Systems

Course number: Auto 156

Section number: 4349

Units: 5.0

Prerequisites: None

Recommended: Course Eligibility for ENGL 100 OR Course Eligibility for ENGL 100A OR Course Eligibility for ESL 100.

Classroom: Rooms 2320 & 2360, located in Lounibos Hall

Class Hours: Monday & Wednesday from 9 a.m. until 11 a.m. in room 2320, and Thursday from 9 a.m. until 12 p.m. in room 2360

Course Description

This course teaches theories, designs, and operation of automotive electrical and electronic systems including starting, charging, and other chassis electrical systems. The course also explores techniques of troubleshooting, service, and repairs of automotive electrical and electronic systems, and includes an introduction to computer controlled systems.

This class will also prepare students to take the A.S.E. (Automotive Service Excellent) Electrical/Electronic Systems Certification Examination.

Instructor Information

Name: Clifford W. Norton Jr.

Office: 2302 Lounibos Hall

Office hours:

Tuesday, Thursday, & Friday from 11:00 a.m. to 1:00 p.m.
Fridays from 9:00 a.m. to 11:00 a.m. by appointment only

You may contact me in either Lounibos 2302 or 2360.

Office phone number: 527-4404 (has voice-mail)

Auto Shop phone number: 527-4495

Voice-mail number: 527-4999, box number 4404

Email address: cnorton@santarosa.edu

Textbook: *Automotive Electrical and Engine Performance, ver. 7e*, by James Halderman

Materials fee: \$13.00 (paid during enrollment)

Materials Needed

1. Assigned text book.
2. Scantron sheets to take quizzes and exams. Three packages of six should be enough.
3. Number 2 pencils (for scantrons)

Outcomes and Objectives

Student Learning Outcomes:

Students will be able to:

1. Perform routine-to-detail testing of electrical and electronic circuits.
2. Meet the basic electrical and electronic diagnostic needs of their employers.
3. Utilize different types of electrical diagnostic test equipment.
4. Gain personal knowledge and experience in vehicle repair.
5. Research, synthesize, and assess technical information in reference materials.

Objectives:

Upon completion of this course, students will be able to:

1. Explain theories of automotive electrical and electronic systems design and operation.
2. Apply the principles of electricity to evaluation and repair of common electrical systems.
3. Differentiate among types of electrical circuits.
4. Troubleshoot electrical circuits.
5. Diagnose electrical system problems using electrical system schematics.
6. Test, evaluate and repair common electrical systems.
7. Explain the requirements and processes for obtaining A.S.E. (Automotive Service Excellence) Auto Electrical System Certification and B.A.R. (Bureau of Automotive Repair) Lamp Adjuster Certification.
8. Demonstrate eligibility to enter the automotive trade as an apprentice level technician specializing in automotive electrical systems.
9. Use computer information systems, manufacturers shop manuals, and the World Wide Web to access necessary repair information.

Topics and Scope

1. Theories of Automotive Electrical and Electronic Systems
2. Principles of electricity
3. Electrical and Circuit Theory
4. Safety
5. Electronic fundamentals

Topics and Scope cont.

6. Types of test equipment
7. Troubleshooting electrical circuits
8. Batteries
9. Starters
10. Charging systems
11. Lighting systems
12. Instrument cluster and gauges
13. Accessory systems
14. Ignition systems
15. Computer fundamentals

Assignments

1. Students will be required to keep a notebook of all class assignments and class notes that will be graded for completeness and organization.
2. Class performances and performance exams: In the lab, students will be evaluated on their ability to follow industry approved diagnostic and repair procedures in a reasonable amount of time.
3. Electrical circuit and component identification
4. Lab reports: Complete work orders, diagnostic sheets, parts orders, and time sheets correctly and in a neat and readable manner.
5. Reading: 50 pages per week.

Lab Activities

Lab activities consist of worksheets and exercises assigned by the instructor. These activities are coordinated with, and related to, classroom lecture/discussion topics. As the semester progresses we will begin to work on vehicles owned by students or staff, but only as they relate to current or past topics covered in this class. **The lab/shop sessions are not to be used for personal vehicle maintenance or hobby projects.** At the instructor's discretion, and if class progress is good, an open shop session may be scheduled for personal vehicle inspection and maintenance.

The following Lab procedures and precautions must be observed:

- **Safety First!**
 - **Follow all posted shop safety requirements.**
 - Safety glasses must be worn in the shop area whenever there is work going on in the shop!
 - Safety glasses must be worn when:
 - working on a vehicle
 - under a raised vehicle
 - doing brake work
 - working with aerosols or other chemicals
 - working with hazardous equipment, i.e. rotating devices such as grinders, brake lathes, drills, etc.
 - working with striking tools, i.e. hammers, chisels, punches, air chisels, etc.
 - No jewelry may be worn when working in the shop. This includes rings, necklaces, and anything that hangs loose or may dangle into a rotating device or a potential electrical shock area.

Lab Activities – Cont.

- Long hair must be restrained to prevent getting it tangled in rotating equipment or tools.
 - No loose clothing is allowed while working in the Lab. Loose attire may become tangled in machinery.
 - Proper work attire should be worn. This means closed toe shoes (preferably work shoes with oil-resistant, non-slip soles); long pants (preferably jeans or heavy material work pants); nitrile gloves (provided in certain lab classes that are particularly dirty).
 - You must know where the fire extinguishers, first aid kit, eye wash stations, and shower stations are located, and **be familiar with how to use these safety items.**
 - Before attempting any lab exercise or worksheet, students must be familiar with the procedures and tools involved (e.g., read the instructions, watch an instructor demonstration, or other appropriate methods). If in doubt, the student must get help from a lab assistant or the instructor. If not given an okay by the instructor, do not attempt the activity!
- Work sheets and lab assignments must be signed by the instructor immediately upon completion. **Do not move on to another job until the current assignment is checked off by the instructor!**

You are expected to arrive at work (the Lab) on time and stay until quitting time (end of Lab). If you must leave class early, check-in with your instructor first. Participation is a part of your final grade!

Course Schedule and Outline

The instructor will distribute the *Syllabus* and *Weekly Class Schedule* at the first class meeting. It will contain detailed class information concerning:

- Important dates
- Reading assignments
- Due dates for written assignments
- Quizzes
- Examination dates

NOTE: The class syllabus and weekly schedule are also available online.

Online Activities

Visit the class homepage on the SRJC website. Look up this section in the schedule of automotive classes, and click on the section number. The section homepage will be displayed. Go to the section titled “Class Check-In” to find instructions on how to access the online activities and information that are available for this section. **NOTE: my grade book for you is shown here.**

EMAIL: I will send emails during the semester containing information about upcoming quizzes, examinations, assignments, and other news of immediate importance such as class closure on short notice. **Check your email account daily** (and make sure you’re checking the email account that you have on record with SRJC). **NOTE:** emails should also appear as an announcement in your student portal. **Check your portal regularly.**

Course Policies

Cell Phones: Cell phone use is not allowed while in class or lab, except for emergency calls.

This is also a common employer's shop rule (no cell phone use during work hours). If you do receive an emergency call, please step outside the room to talk.

Cheating/Plagiarism: Cheating or plagiarism are unacceptable behavior and will result in an immediate two day suspension from class for all students involved; **no exceptions**.

Attendance/Tardiness: Your attendance is expected at all class meetings and tardiness is not acceptable. Consider this as valuable training for the work place; your employer will expect you to be at work every day. You are expected to remain in class or lab until dismissed by the instructor (this policy is also common in an employee/employer relationship)

No Smoking Policy: Santa Rosa Junior College is a non-smoking campus. No smoking is allowed anywhere on campus or within 20 feet of the campus. Please read the official policy included in this syllabus.

Class Participation: Your participation in class discussions is recommended and expected. Asking questions is a short cut to knowledge.

Missed Exams or Assignments: Missed examinations are discouraged, but may be rescheduled with the instructor on a case-by-case basis. Assignments (lab sheets, homework, etc.) should be turned in on the dates noted in the course outline. Late assignments are discouraged and will not be accepted more than two weeks past the due date.

Lab Safety: Safe procedures take precedence over everything else in our shop! Safe clothing must be worn at all times. Safety glasses must be worn when work is going on in the shop.

Class Disruption: Be respectful of your classmates and instructor. Please do not engage in disruptive activities such as these:

- NO CELL PHONES!
- Monopolizing the class discussion and interrupting others while they speak. Participation is a good thing, but monopolizing the class is not.
- Carrying on private conversations during class. You may think that your voices are low, but your talking will disrupt the class! If your conversation pertains to the class, please speak up at an appropriate time.
- Bringing pets to class. Unless the pet is a registered aid animal (check with DRD), do not bring it to class.
- Bringing children to class.
- Eating in class. It's disruptive due to noise, and often smells offensive to the class.

Student Conduct Policies:

Please visit the following web links and familiarize yourself with the policies of SRJC concerning student conduct. You are responsible for your conduct and for complying with SRJC policies.

<https://rightsresponsibilities.santarosa.edu/>

Tests and Quizzes

- **Take notes**, you may use any hand written notes during quizzes and examinations. NOTE: a suggestion is to listen during lectures and jot down small notes about areas to look up during your evening reading. Also, make notes about chapter end “review questions” and make notes about chapter quiz questions.
- You will be given a midterm examination and a final examination.
- ***Final examination will be administered on Wednesday of week 18, from 8a.m. until 9:45a.m.***

Study Tips

- **Take notes during class**, and use your class notes to study for exams.
- Use your lab sheets as a study tool and to increase your final grade. ***Neatness and content quality count toward your grade!***
- Keep your quiz answer sheets, look up the correct answers to any questions that you answered incorrectly, and use the answer sheets to write notes, and study for midterm and final exams.

Grading

Your grades will be based on the following areas and count in the percentages noted:

Problem solving: Lab worksheets and reports and assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills. Examples are: lab worksheets/workbook, and repair orders...

5 - 20% Counts up to 150 points

Skill Demonstrations: All skill-based and physical demonstrations in the auto lab used for assessment purposes including skill performance exams. Examples are: shop skills, component identification and diagnostic skill...

30 - 50% Counts up to 300 points

Exams: Performance exams, Component identification, and all forms of formal testing other than skill performance exams. Exams may be: multiple choice, true/false, or written answer...

30 - 50% Counts up to 400 points

Other: Includes any assessment tools that do not logically fit into the above categories. Examples are: your notebook, homework, attendance, and participation...

10 - 15% Counts up to 175 points

Extra Credit: Refer to your grade book on CATE for current extra-credit tasks.

Counts up to 115 points

Grading cont.

Unless otherwise informed by the instructor, grades are calculated based on total semester points that you have earned. Grades may be adjusted to a class curve, but you are guaranteed the grade listed in the following chart if you attain the point total associated with that grade.

Letter grade A = 90% - 100% (greater than 900 points)

Letter grade B = 80% - 90% (800-899)

Letter grade C = 70% - 80% (700-799)

Letter grade D = 60% - 70% (600-699)

Letter grade F = \leq 60% (less than 600)

Follow your grade totals online. You will start at zero points and are working for a maximum total point count of approximately 1000 (look on CATE to determine this semester's exact count). Remember that the midterm and final exams count triple (x3).

You may also accumulate points for extra credit work (raising the total points possible to greater than the nominal total of 1000 points) – note that your grade at 1075 will still be an “A”; the grade scale doesn't alter. Much of this extra credit work will be repair jobs that are performed on customer's vehicles. All of this work must be verified with a repair order (available from the tool room) to receive credit. The repair order must be neatly, accurately, and completely filled out and all diagnostic and repair steps must be thoroughly, and in detail, written on the repair order to receive full credit.

Emergency Evacuation Plan

In the event of an emergency during class that requires evacuation of the building, please leave the building immediately, but calmly. **Our class will meet at the South end of Lounibos Hall in the parking lot** to make sure everyone got out of the building safely and to receive further instructions. If you are a student with a disability who may need assistance in an evacuation, please see me during my office hours as soon as possible so we can discuss an evacuation plan.

Pedagogical Philosophy

My philosophy is to teach you the theoretical and practical aspects of automotive repair technology in a manner that will allow you to understand and then retain that information; to inspire your curiosity and alter your preconceived ideas when necessary; to teach you skills and habits that will carry into your personal and work lives: skills such as personal responsibility, dependability, critical thinking, thoroughness, work ethic, and communication. I will do all this while remaining as flexible to your needs as possible, and without coddling you or sacrificing the discipline that is a necessary part of your education, your future success in your career, and your life.

Campus Resources

SRJC has many resources for its students. These are only a few of them. Please refer to the SRJC website for more information (www.santarosa.edu). Click the “For Students” tab, then the “Student Services” tab.

DRD (Disability Resources Department)

If you are having trouble learning or understanding in class and don't know why, you can get a free consultation at DRD. ***It may change your life!***

Just a few of the DRD services:

- Disability screening
- Test taking help
- Aids for the physically disabled

Santa Rosa Campus DRD Office information:

Email: disabilityinfo@santarosa.edu

Phone: (707) 527-4278

TTY: (707) 528-2442

Fax: (707) 524-1768

Office Location: Room 637, Analy Village, Bldg. C

Office Hours:

Fall & Spring Semesters: Monday-Friday, 8:00 AM to 4:00 PM

Summer Semester: M-Th, 8:00 AM to 4:00 PM, Closed Friday

Mailing Address:

Santa Rosa Junior College
Disability Resources Department.
1501 Mendocino Avenue
Santa Rosa, CA 95401-4395

College Skills/Tutoring Department

- ESL (English as a second language)
- Math skills improvement
- Writing skills classes

The College Skills Department is located in Analy Village, on the west side of campus.

The Academic Skills Lab is located in Building H, Rm 601.

The Math Lab is in Building F, Rm 615.

The Department Office is in Building G, Rm 605.

The Phone Number is (707) 527-4834.

Counseling Department

Santa Rosa Campus

Bertolini Student Center, 2nd Floor
(707) 527-4451

M, T, Th, F, 8:00 AM - 5:00 PM
W, 8:00 AM - 7:00 PM

Closed Fridays during June & July

“As a new student, seeing a counselor is probably the most important thing you can do”. You don’t need to go through SRJC without a clue! Hook up with a counselor. You may just find a friend, guide and advocate in the Counseling Department. At the least, you will formulate a plan of study and explore your interests and life possibilities.

Doyle Library

- Tutoring
- Computer use (free)
- Coffee shop
- Quiet study space

Accommodations for Students with Disabilities

If you need disability related accommodations for this class, such as a note taker, test taking services, special furniture, helper animal, etc., please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to the instructor as soon as possible. You may also speak with the instructor privately during office hours about your accommodations. If you have not received authorization from DRD, it is recommended that you contact them directly. DRD is located in Analay Village on the Santa Rosa campus, and Jacobs Hall on the Petaluma Campus.



Attendance:

Please review the official SRJC attendance policy shown below:

According to the SRJC policy, **four missed days is considered excessive absence from Auto 156. For an absence to be excused, you must clear the absence with the instructor.**

8.1.5P

ATTENDANCE REQUIREMENTS

ADOPT: APRIL 10, 2012

CATEGORY 3 REVISION: FEBRUARY 11, 2014

TITLE 5: 58004

Federal Executive Order 13607

SRJC Policy 8.2.10

A. Attendance

1. Students are expected to attend, and in the case of online classes, participate in, all sessions of the course in which they are enrolled.
2. A student may be dropped from any class when that student's absences exceed ten percent (10%) of the total hours of class time.
3. With advanced notice and appropriate documentation, members of the U.S. Military Armed Services and Reservists shall have their absences accommodated due to service obligations provided that satisfactory academic progress is being made prior to suspending their studies. For the purpose of this policy, a student is making satisfactory academic progress so long as, at the start of the absence, the student has the potential to pass the class after completing the remaining assignments.
4. Specific courses may have stricter requirements based on professional certification mandates or curricular situations in which absences will severely compromise the learning for other students (such as team or performance ensemble courses). *These stricter requirements shall be stated in the course syllabus.*

B. Nonattendance

1. Students who fail to attend the first class meeting may be dropped by the instructor. For classes that meet online, students who fail to log on and initiate participation by 11:59 p.m. Pacific Time of the first day of the class may be dropped by the instructor. The start date for full semester online classes is the official first day of the semester; for short-term classes, the first day will be specified in the schedule of classes.
2. Instructors are required to drop all No-Show students immediately following the second class meeting. A No-Show is an enrolled student who has not attended any class meeting of the course. For classes that meet online, a No-Show is an enrolled student who has not logged on and initiated active participation by 11:59 p.m. Pacific Time of the second day of the class.

C. Excessive absence defined

1. Instructors shall state in each course syllabus what constitutes excessive absence for that course.
2. Any student with excessive absences may be dropped from the class.



NOTE: This policy includes no vaping and no chewing tobacco

Book

Sonoma County Junior College District Board Policy Manual

Section

Section 6: Facilities Planning

Title

District Smoke-Free Environment Policy

Number

6.8.6

Status

Active

Adopted

January 9, 1989

Last Revised

January 8, 2013

Last Reviewed

January 8, 2013

6.8.6

DISTRICT SMOKE-FREE ENVIRONMENT POLICY

ADOPT: JANUARY 9, 1989

REVISED: DECEMBER 12, 2000

REVISED: APRIL 12, 2005

REVIEWED: DECEMBER 9, 2008

REVIEWED/NO CHANGE: JANUARY 10, 2012

CATEGORY 3 REVISION: JANUARY 8, 2013

The Sonoma County Junior College District promotes a safe and healthful atmosphere for students, faculty, staff and visitors on its campuses, centers and other off-campus sites by reducing the health risks associated with tobacco smoke and related products. Therefore, the District is a tobacco- and smoke-free environment.

Smoking of any kind, including use of e-cigarettes or electronic cigarettes, and all uses of tobacco are prohibited on all property and in all indoor and outdoor spaces owned, leased, licensed, or otherwise controlled by the District, and in all District-owned vehicles.



NOTE: This policy includes no vaping and no chewing tobacco

Book

Sonoma County Junior College District Board Policy Manual

Section

Section 6: Facilities Planning

Title

District Smoke-Free Procedural Guidelines

Number

6.8.6P

Status

Active

Adopted

March 8, 2005

Last Revised

January 8, 2013

Last Reviewed

January 8, 2013

6.8.6P

DISTRICT SMOKE-FREE ENVIRONMENT PROCEDURAL GUIDELINES

REVIEWED: March 8, 2005

ADOPTED: APRIL 12, 2005

REVISED: JULY 14, 2009

REVIEWED/NO CHANGE: JANUARY 10, 2012

CATEGORY 3 REVISION: JANUARY 8, 2013

GOVERNMENT CODE: 7597

ED CODE: 76031; 76033(e); 7233

Implementation of the District Smoke-Free Environment Policy will be the shared responsibility of every student, faculty member, staff person and visitor; additionally, the Sonoma County Junior College District Police shall enforce all state, county and city ordinances that prohibit smoking on or near District property.

In accordance with the District Smoke-Free Environment Policy, the following procedures are implemented:

1. Notification of the Smoke-Free Environment policy shall be publicized;
 - a. on a continual basis in the College Catalog and Class Schedules.
 - b. on signs posted at major campus entrances.
 - c. on signs posted at building entrances, breezeways, air intake systems, etc., as needed.
2. No cigarette urns will be placed on District property.
3. The District will support and assist efforts to stop smoking by providing literature, referrals to community cessation programs and by sponsoring periodic campus smoking cessation campaigns.
4. Tobacco products will not be sold or used on District property.

(Current as of Aug. 2016)

SRJC Enforces No-Smoking Ordinance on Campuses and Sites

At the opening of the fall semester starting August 17, 2009, the Santa Rosa Junior College District Police will begin issuing citations to enforce the City of Santa Rosa's no-smoking ordinance on and near the Santa Rosa Campus and SRJC's Southwest Center.

Smoking is prohibited not only *on* the college's property, but also *within 20 feet* of all Sonoma County Junior College District property. This means that smoking is also prohibited on the sidewalks and a portion of the city streets adjacent to college property.

City fines for smoking ordinance violations are up to \$100 for the first offense, \$250 for the second offense, and \$500 for each subsequent offense.

SRJC is currently working with Sonoma County and the cities of Windsor and Petaluma to extend the same enforcement on and near *all* college sites.

Background of SRJC's Smoke-free Policy

In January 1989, the Board of Trustees of the Sonoma County Junior College District adopted a smoke-free environment policy to promote a safe and healthy atmosphere for students, faculty, staff, and visitors to its campuses, centers, and multiple sites. This policy was revised in April 2005 to clearly state that tobacco use is prohibited both indoors and outdoors on district-controlled property.

Despite this policy and clearly worded signage across SRJC sites, smoking has not only continued, but it has become increasingly worse. In response, the District's Associated Students initiated a move toward stronger policy enforcement, specifically the ability of District Police to issue citations to policy violators. It was determined that the best way for SRJC to issue citations is through the enforcement of state, county, and city laws and ordinances.

The District has entered into an agreement with the City of Santa Rosa that specifically grants SRJC's District Police the authority to enforce the city's nonsmoking ordinances on or near District property, and with that agreement, SRJC's District's Police now has the legal authority to issue city citations to violators of the college's smoke-free policy, both on and within 20 feet of District property in Santa Rosa.

At SRJC's Board of Trustees meeting on July 14, 2009, Board Procedure 6.8.6P was revised - Smoke-Free Environmental Procedural Guidelines - to include the following language: "...the Sonoma County Junior College District Police shall enforce all state, county, and city ordinances that prohibit smoking on or near District Property."