

Syllabus: Auto 154: Automotive Brakes, Steering, and Suspension Spring 2023, Section 4223

Lecture: Room 2389 Lounibos Hall, MW 1pm to 3pm

Lab: Room 2360 Lounibos Hall, TTh 1pm to 5pm

Instructor: David Lemmer

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Office: Lounibos Service Center room 2303/AutoShop, MW 3pm-5pm
and by appointment.

Recommended Preparation:

Course Eligibility for ENGL 100 or ESL 100

Prerequisites: Course Completion of AUTO 80 or Course
Completion of DET 179 (or DET 80 or DET 60)

Course Description:

Course covers the theory, design, operation, troubleshooting and repair of brakes, steering and suspension systems of most automobiles.

Lecture, demonstration and practical lab experience also emphasize proper and safe use of tools and equipment.

Prepares students to take the A.S.E. (Automotive Service Excellence) Brake and Suspension Certifications.

Student Learning Outcomes:

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

1. Explain the operation, diagnosis, and repair of modern brake, steering, and suspension systems.
2. Demonstrate safe and proper usage of equipment and machinery used to service modern brake, steering, and suspension systems.
3. Demonstrate the knowledge needed to pass the ASE certification test A4-Suspension and Steering.
4. Demonstrate the knowledge needed to pass the ASE certification test A5-Brakes.

Objectives:

1. Apply mathematical calculations to theory and repairs of brake, steering and suspension systems.
2. Relate applicable physics theories to the operation of brake, steering, and suspension systems.
3. Interpret an SDS (safety data sheet, formerly material safety data sheet).
4. Describe the function of control valves used in automotive brake systems and explain brake electrical circuits and devices.
5. Discuss theory of and methods and equipment for increasing the driver's braking force.
6. Describe parking brake operation and perform system diagnosis, service, and repair.
7. Diagnose bearing defects and wheel bearing problems and repack, reassemble, adjust, and replace bearings on a vehicle.
8. Diagnose tire problems and inspect, repair, and remount tires.

9. Perform wheel balance procedures.
10. Differentiate among types of front and rear suspension systems, discuss their purposes, and describe the suspension system characteristics required on different vehicles. Demonstrate and perform service procedures.
11. Discuss the construction and operation of steering columns and linkage systems, and conduct diagnostic and replacement procedures.
12. Explain power steering pump design and operation and power steering belt construction and replacement.
13. Explain the operation of manual and power recirculating ball steering gears and perform service procedures.
14. Describe the operation and service of a rack and pinion type steering gear, and perform adjustments and other services, including disassembly and reassembly of the units.
15. Diagnose wheel alignment and vehicle tracking problems, and utilize typical computer alignment systems to perform tire alignment.
16. Maintain a safe work environment in an auto shop.
17. Explain the basic standards for respiratory safety around asbestos and the requirements for disposal of hazardous asbestos waste.
18. Explain the operation of and perform diagnosis and repair of automotive brake, steering, and suspension systems.

Representative assignments:

1. Reading: 20 - 50 pages per week. Answering the Chapter Quiz questions.
2. Laboratory ability to follow industry approved diagnostic and repair procedures in a reasonable amount of time based on flat rate timetables.
3. Laboratory completion of work orders, diagnostic sheets, parts orders, and time sheets in a neat and readable manner.
4. Laboratory to disassemble, inspect and reassemble parts and systems (skill demonstrations and performance exam).
5. Compile a notebook of all lab materials, class assignments and class notes.
6. Four tests, including final exam.

Methods of Evaluation / Basis of Grade:

Writing 5%: Assessment tools that demonstrate writing skill and/or require students to organize and explain ideas in writing.

Written repair orders, notebooks.

Problem solving 10%: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem-solving skills.

Reading, chapter questions, and analyzing lab reports.

Skill Demonstrations 40%: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Machine operations, weekly repair operations.

Exams 40%: All forms of formal testing, other than skill performance exams.

Multiple choice, matching items, completion

Other 5%: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation: Attendance at all classroom and lab sessions is expected. Missing more than 10% of this time can result in being dropped from the class. What this means is that **no more than 7** class days can be missed.

This means you may be dropped from the roster if you miss 8 class days.

Unless otherwise informed by the instructor, grades are calculated based on total semester points that you have earned out of total points possible. 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. Please note that a passing grade is “C” or better and is required for the “Brakes” certificate.

Letter grade A = 90% - 100%

Letter grade B = 80% - 90%

Letter grade C = 70% - 80%

Letter grade D = 60% - 70% (failing)

Letter grade F = $\leq 60\%$ (failing)

Follow your grade totals on-line. You will start at zero points and are working for a maximum total point count of approximately 1200 (look on Canvas to determine this semester’s exact count). Remember that the midterm exams count double (x2) and final exam counts triple (x3). See methods of assessment above for the weights attached to various assignments.

Textbooks:

AUTOMOTIVE CHASSIS SYSTEMS, 8e

Halderman, 2021, Pearson Education

ISBN-13: 9780135758571

(paperback) all versions are OK

Important Dates and Deadlines:

Date Class Begins:	01/18/2023	Date Class Ends:	05/18/2023
Last Day Add w/o add code:	01/24/2023	Last Day Add with add code:	02/05/2023
Last Day Drop for Refund:	01/29/2023	Last Day for P/NP option:	N/A
Last Day Drop w/o W:	02/05/2023	Last Day Drop with W:	04/23/2023
Date First Census:	02/06/2023	Date Final Exam:	05/24/2023

Final Exam Date and Time: Please note!

The Final Exam is on Wednesday, May 24 from 1:00pm to 3:45pm!

Course Policies

Cell Phones: Cell phones have limited value while in class or lab. A common employer's shop rule may be no cell phone use during work hours. In this class I am going to say, "no inappropriate use of the phone in class or in lab". If you are observed using your phone inappropriately in class you may be asked to leave until the end of the next break. Multiple infractions can result in a 2-day suspension.

Note: if you receive an emergency call, please step outside 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.

No Smoking Policy: Santa Rosa Junior College is a non-smoking campus; this includes vaping. No smoking is allowed anywhere on campus or within 20 feet of the campus.

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

Missed Examination Policy: Missed examinations are discouraged, but may be rescheduled with the instructor on a case-by-case basis up to two weeks past the original exam date.

Late Homework / Assignment Policy: Homework and all other types of assignments will only be accepted up to two weeks late.

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 daily. You are expected to remain in class or lab until dismissed by the instructor (this policy is also common with employers).

Please refer to the attendance policy on the following page:

<https://catalog.santarosa.edu/book/export/html/291>

PROJECTS IN THE SHOP

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 working on projects in the shop. If it cannot be done safely, **don't** do it. If you have any doubt, ask the instructor or student aid. If you find yourself struggling for more than a few minutes, there is likely a tool for that or some trick of the trade. Please don't hesitate to ask, I am more than happy to share those with you.

Student Conduct:

We will conduct ourselves in a manner that reflects our awareness of common standards of decency and the rights of others. All students are expected to know the Student Conduct Code (http://www.santarosa.edu/for_students/rules-regulations/scs/section1.shtml) and adhere to it in this class. Students who violate the code may be suspended from 2 classes and referred to Vice President of Student Services for discipline.

Respect:

The best way to learn is through active participation; therefore, we respect others when talking by being on time, listening actively, and by being polite even when we disagree with another's viewpoint. Please turn off all electronic devices. If you use a laptop for note taking, please sit in the front row with the sound off. No food in class please.

Academic Integrity: All written work is to be original; plagiarism of any kind will result in a failing grade on that assignment. Students who plagiarize or cheat may be suspended [for one or two class meetings by the instructor] and referred to the Vice President of Student Services for discipline sanction, in cases of egregious violation. Please read the college policy/procedure on academic integrity at: <http://www.santarosa.edu/polman/3acadpro/3.11P.pdf>

Emergency Evacuation Plan: In the event of an emergency during class that requires evacuation of the building, please leave the class 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.

Accommodations for Students with Disabilities: If you need disability related accommodations for this class, such as a note taker, test-taking services, special furniture, 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. <<https://drd.santarosa.edu/>>

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the instructor reserves the right to modify, supplement and make changes as the course needs arise.

Pedagogical Philosophy

My philosophy is to provide you with the basic science and theory behind all of the automotive systems covered in class. In addition, I will give you practical, hands on tips for being a successful automotive technician. Ultimately, my goal is to empower you to think for yourselves to create problem solving techniques that you can use in any situation for the rest of your lives. Key to success here is communication, cooperation, creativity, and a desire for excellence. Automotive technology is evolving as rapidly now as it ever has. Keeping up with that promises to be as rewarding as it is challenging. I promise to be your partner and mentor as you begin your trek down this path.

This syllabus is an agreement, continued participation in this class means that you agree to the policies and procedures outlined in this syllabus.

David J Lemmer
