

AUTO 54 Course Outline as of Fall 2006**CATALOG INFORMATION**

Dept and Nbr: AUTO 54 Title: AUTO BRAKES,STEER, SUSPN

Full Title: Automotive Brakes, Steering and Suspension

Last Reviewed: 2/24/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	7.00	Lecture Scheduled	5.00	17.5	Lecture Scheduled	87.50
Minimum	7.00	Lab Scheduled	7.00	8	Lab Scheduled	122.50
		Contact DHR	0		Contact DHR	0
		Contact Total	12.00		Contact Total	210.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 175.00

Total Student Learning Hours: 385.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

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. Prepare students to take the A.S.E. (Automotive Service Excellence) Engine Repair Certification.

Prerequisites/Corequisites:**Recommended Preparation:**

Course Eligibility for ENGL 100 and Course Eligibility for CSKL 372 (or CSKLS 372 or CSKL 372) OR Course Eligibility for EMLS 100 (or ESL 100)

Limits on Enrollment:**Schedule of Classes Information:**

Description: Theory, design, operation, troubleshooting and repair of brakes, steering and suspension systems of most automobiles. Emphasizes proper and safe use of tools and equipment. Prepare students to take the A.S.E. Engine Repair Certification exam. (Grade Only)

Prerequisites/Corequisites:

Recommended: Course Eligibility for ENGL 100 and Course Eligibility for CSKL 372 (or CSKLS 372 or CSKL 372) OR Course Eligibility for EMLS 100 (or ESL 100)

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:	Transferable	Effective: Fall 1981	Inactive: Fall 2017
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon completion of this course, the student will be able to:

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 MSDS (material safety data sheet).
4. Diagnose problems and perform service, and inspections to disc and drum brake fluid systems, brake system components, and master cylinders.
5. Describe the function of control valves used in automotive brake systems and explain brake electrical circuits and devices.
6. Perform valve service and electrical diagnosis and repair.
7. Discuss theory of and methods and equipment for increasing the driver's braking force.
8. Describe parking brake operation and perform system diagnosis, service, and repair.
9. Discuss the principles involved in a feasible antilock brake system, and perform general service procedures for individual components and the system.
10. Discuss the importance of bearings in reducing friction, providing quiet operation, and maintaining proper component position.
11. Diagnose bearing defects and wheel bearing problems and repack, reassemble, adjust, and replace bearings on a vehicle.
12. Discuss the importance of tire design quality as it relates to tire motion forces.
13. Diagnose tire problems and inspect, repair, and remount tires.
14. Perform wheel balance procedures.

15. Discuss the design and operation of shock absorbers and struts.
16. Inspect, diagnose, and service shock absorbers and struts.
17. Differentiate among types of front suspension systems and among types of rear suspension systems, discuss their purposes, and describe the suspension system characteristics required on different vehicles.
18. Diagnose problems and service a variety of front and rear suspension systems.
19. Describe the most common types of computer-controlled suspension systems and their operations, and perform service procedures.
20. Discuss the construction and operation of steering columns and linkage systems, and conduct diagnostic and replacement procedures.
21. Explain power steering pump design and operation and power steering pump belt construction and replacement.
22. Perform power steering system diagnosis and repair, including power steering pump overhaul and system pressure checks.
23. Explain the operation of manual and power recirculating ball steering gears and perform service procedures.
24. 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.
25. Describe the operation of and perform service on four-wheel steering systems.
26. Discuss frame design and perform service procedures.
27. Diagnose wheel alignment and vehicle tracking problems, and utilize typical computer alignment systems to perform tire alignment.
28. Maintain a safe work environment in an auto shop.
29. Correctly identify and safely operate tools and equipment.
30. Explain the basic standards for respiratory safety around asbestos and the requirements for disposal of hazardous asbestos waste.
31. Demonstrate eligibility to enter the automotive trade as an apprentice level technician specializing in brakes, steering and suspension systems.

Topics and Scope:

x

Assignment:

Representative assignments:

1. Reading: 20 - 50 pages per week.
2. In the laboratory, students will be evaluated on their ability to follow industry approved diagnostic and repair procedures in a reasonable amount of time based on flat rate timetables.
3. In the laboratory, students will complete work orders, diagnostic sheets, parts orders, and time sheets in a neat and readable manner.
4. In the laboratory, students will 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. Write A 2-3 page paper relating theory and design to the troubleshooting and repair of brakes, steering, and suspension systems.
7. Four tests, including final exam.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Paper.

Writing
10 - 20%

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

Lab eval.; work orders, diagnostic sheets, etc.

Problem solving
15 - 20%

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

Follow procedures; dissassemble, inspect, reassemble

Skill Demonstrations
15 - 20%

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

Multiple choice, Matching items, Completion

Exams
35 - 45%

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

Attendance and participation; notebook.

Other Category
10 - 15%

Representative Textbooks and Materials:

Knowles, Don. Today's Technician: Automotive Suspension & Steering Systems. Delmar, 2002.

Today's Technician: Automotive Brake Systems. Owen, Clifton. Delmar Thompson Learning, 2003.

Instructor prepared materials.