AUTO 54 Course Outline as of Summer 2010

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

Prerequisites/Corequisites:

Recommended Preparation:
Course Eligibility for ENGL 100 or ESL 100 AND Course Completion or Concurrent Enrollment in AUTO 100

Limits on Enrollment:

Schedule of Classes Information:
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. Prepares students to take the A.S.E. (Automotive Service Excellence) Brake and Suspension Certification. (Grade Only)

Prerequisites/Corequisites:
Recommended: Course Eligibility for ENGL 100 or ESL 100 AND Course Completion or Concurrent Enrollment in AUTO 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, students 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. 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 suspension systems and among types of rear suspension systems, discuss their purposes, and describe the suspension system characteristics required on different vehicles. systems and their operations, 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 pump 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, perform diagnosis, and repair of automotive brake, steering, and suspension systems.

Topics and Scope:

This course will provide classroom instruction relating to the diagnosis and repair of the following automotive brake and chassis systems:
1. Introduction to Brakes
2. Fundamentals of Hydraulics
3. Hydraulic-Brake System Components
4. Drum Brake Operation
5. Disc Brake Operation
6. Parking Brake Operation
7. Vacuum-Assist Brakes
8. Hydraulic-Assist Power Brakes
9. Electrohydraulic-Assist Power Brakes
10. Antilock Brake Systems
11. Automotive Suspensions
12. Fundamentals of Steering and Suspension Services
13. Steering Gears
14. Tire and Wheel Balancing
15. Wheel Alignment

Assignment:

Representative assignments:
1. Reading: 20 - 50 pages per week.
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 dissemble, 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: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written diagnostic reports, notebooks	Writing 0 - 10%

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

Reading and analyzing lab reports	Problem solving 5 - 10%

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

Class performances, performance exams	Skill Demonstrations 30 - 40%

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	Other Category 5 - 10%

Representative Textbooks and Materials:
Automotive Brake Systems, Check-Chart, (no author) Harper Collins, 4th Ed., 2006
Automotive Suspension & Steering Systems, by Thomas W. Birch, Delmar, 4th Ed. 2007