

Lassen Community College Course Outline

AT-56 Steering and Suspension

3.0 Units

I. Catalog Description

This course is designed to provide the student with skills in alignment of front suspension and rear wheel alignment where applicable and inspection and repair of steering and suspension components. Basic and computerized equipment will be utilized. The contents of this course conforms to ASE Educational Foundation standards for steering and suspension. This course has been approved for hybrid delivery.

Recommended Preparation: Successful completion of ENGL105 or equivalent multiple measures placement.

34 Hours Lecture, 51 Hours Lab, 68 hours outside-of-class, 153 total student learning hours
Scheduled: Spring

II. Coding Information

Repeatability: Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 094800

III. Course Objectives

A. Course Student Learning Outcomes

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

1. Diagnose, analyze, and repair common steering and suspension alignment malfunctions at a beginner level
2. Demonstrate proper use of specialized tools and equipment in performing steering and suspension work.

IV. Course Content

A. Safety and shop routine

1. Shop safety and routines
2. Vehicle identifying information, customer concern, related service history, cause, and correction.
3. Identify and interpret steering and suspension system concern; determine necessary action.

B. Tires and wheels

1. Tire construction
2. Tire and wheel size and measurement
3. Tire dismount and mounting and proper torqueing techniques
4. Balancing and rotation
5. Wear pattern, noise, vibration, and pull diagnosis
6. Repair techniques
7. Tire pressure monitoring systems theory, diagnosis, and calibration

C. Wheel bearings

1. Types
2. Cleaning and inspection
3. Grease packing and adjustment

- D. Suspension: Theory, design, inspection, and diagnosis**
 - 1. Types - solid axle and independent suspension
 - 2. Coil springs, short arm long arm
 - 3. Leaf springs
 - 4. Torsion bars
 - 5. Macpherson strut
 - 6. Sway arm and stabilizer system
 - 7. Shock absorbers
- E. Checking and adjusting alignment angles**
 - 1. Theory and diagnosis: vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return
 - 2. Alignment pre-checks
 - 3. Four wheel alignment (caster, camber and toe)
 - 4. Thrust angle
 - 5. Toe-out-on-turns and SAI (steering axis inclination)
- F. Steering systems: Theory, diagnosis and repair**
 - 1. Steering wheel and column
 - 2. SRS/Air bag system disable and enable and clock spring removal and centering
 - 3. Steering gear
 - 4. Rack and pinion
 - 5. Steering linkage
 - 6. Four wheel steering
 - 7. Electronic steering systems
- G. Power Steering systems**
 - 1. Theory of operation
 - 2. Pumps and hoses
 - 3. Belt inspection and replacement

V. Assignments

A. Appropriate Readings

- 1. Assigned Textbooks
- 2. Manufacturers bulletins
- 3. Various service manuals

B. Writing Assignments

Typical writing assignments will include:

- 1. Providing written answers to assigned questions
- 2. Performing mathematical calculations as assigned
- 3. Maintaining a notebook of class assignments/activities
- 4. Maintain a record of completed assignments/activities

C. Expected Outside Assignments

Appropriate outside assignments may include:

- 1. Researching appropriate readings
- 2. Preparing research reports
- 4. Studying as needed for successful classroom performance

D. Specific Assignments that Demonstrate Critical Thinking

Students will perform analysis and evaluation of readings and/or classroom materials and utilize this analysis in classroom discussion, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

VI. Methods of Evaluation

Traditional classroom delivery:

Term paper (topic choice, thesis statement, outline, bibliography, rough draft, final draft), homework, classroom discussion, essay, journals, lab demonstrations and activities, multiple choice quizzes, and participation.

Hybrid Evaluation

All quizzes and exams will be administered during the in person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery Online Delivery

Traditional Classroom Delivery:

The appropriate method of instruction will be determined by the instructor and may include:

1. Lecture with or without various audio/visual aids.
2. Group problem solving discussion, debate, and/or critique.
3. Demonstration
4. Computer-assisted/other self-paced instruction.
5. Field trips or field assignments.
6. Laboratory assignments utilizing planned activities or 'live' work.

Hybrid Delivery:

Hybrid modality may involve face to face instruction mixed with online instruction. A minimum of 1/3 of instruction, including 100% labs, will be provided face to face. The remaining hours will be taught online through a technology platform as adopted by the district.

VIII. Representative Texts and Supplies

Kershaw and VanGelder; *Master Automotive Technician Series Automotive Steering and Suspension*, 2017, ISBN 9781284102093

Service manuals as determined by the instructor.
Appropriate shop clothing, proper footwear, and safety glasses

IX. Discipline/s Assignment

Automotive Technology

X. Course Status

Current Status: Active
Original Approval Date: 5/22/1990
Revised By: Chad Lewis
Chancellor Approved: 02/28/2013
Curriculum/Academic Standards Committee Revision Date: 02/15/2022