

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**Automotive Technology 143T – Steering and Suspension Diagnosis and Repair Assessment Test Out**

1.5 hours laboratory, .5 units

**Catalog Description**

This assessment course includes summative and criterion tests using actual suspension and steering description, diagnosis, and repair. This course allows a student to demonstrate knowledge of proper operation, disassembly, assembly, repair, and diagnostic techniques for various suspension and steering types and designs, including electronic controls in the department laboratory, or by using distance education technologies, live demonstrations, and recordings of work. The assessments will include various tests using vehicles with symptoms and conditions. This course allows a student residing at a distance from training centers to complete ASE certification requirements. This course accompanies AUTO 143L Steering and Suspension Diagnosis and Repair Laboratory, 143 Steering and Suspension Diagnosis and Repair lecture, and Work Experience classes.

**Prerequisite**

None

**Recommended Preparation**

“C” grade or higher or “Pass” in AUTO 162T Electronics Diagnosis and Repair Assessment Test Out.

**Entrance Skills**

Without the following skills, competencies, and knowledge, students entering this course will be highly unlikely to succeed:

- 1) Demonstrate computer input and output tests and activation using a scan tool
- 2) Obtain and describe normal and abnormal waveforms using a lab-scope
- 3) Test thermistor, potentiometer, variable reluctance, pressure, Hall-effect and related sensors
- 4) Graph and interpret system data using PIDS on a scan tool
- 5) Diagnose and repair computer communication networking faults
- 6) Describe types and functions of computer memory including RAM, ROM, and PROM
- 7) Demonstrate proper diagnosis and repair of electronic system concerns

**Course Content**

- 1) Lab assessment:
  - a. Introduction and safety
  - b. Equipment operation
  - c. Basic hydraulic theory
  - d. Basic laws of physics as related to automotive suspension systems
  - e. Suspension system theory of operation
  - f. Theory of operation of electronic and mechanical suspension systems
  - g. Interrelationship of suspension theory and design as it relates to other system performances
  - h. Tire and wheel design effect on suspension performance
  - i. Active suspension systems
  - j. Hydraulic system fluid procedures using pressure gauges and parameter values
  - k. Suspension component description and operation

**Course Objectives**

Students will be able to:

- 1) Demonstrate and describe standardized safety and hazardous waste handling practices.
- 2) Successfully navigate manufacturer specific repair information for steering and suspension system repairs.
- 3) Demonstrate the Tire Pressure Monitoring System (TPMS).
- 4) Demonstrate the power steering analyzer tool to diagnose faults.
- 5) Test and inspect actual steering and suspension components.
- 6) Perform ball joint deflection tests.
- 7) Diagnose system operation of Electronic Power Assist Steering (EPAS).
- 8) Perform various alignments and correction procedures.
- 9) Test various air suspension concerns and demonstrate knowledge of air system.
- 10) Diagnose Continuously Controlled Dampening (CCD) suspension concerns.
- 11) Perform ride height inspections.

**Method of Evaluation**

A grading system will be established. Grades determined by summative test proficiency in the subject matter using multiple measurements, one of which is a demonstration of the components related to the cause of failure using the diagnostic processes and skills demonstrations of corrections.

- 1) Skills-based summative assessment that measures students' ability to complete the required ASE tasks related foundational knowledge of diagnosis, replacement, repair, and testing of automotive suspension and steering systems.
- 2) Practical exercises that measure students' progress toward mastering tasks related to replacement, repair, diagnosis, memorization of components for testing of suspension and steering systems.
- 3) A student portfolio is required to showcase student comprehension.
- 4) Performance projects used to evaluate student ability to perform repair procedures using web conferencing and simulations.

**Special Materials Required of Student**

- 1) Mechanic's hand tool set
- 2) Approved safety glasses and dress code
- 3) Must have access to high speed internet
- 4) A large screen computer or tablet.

**Minimum Instructional Facilities**

- 1) Auto tech lab (20 bays)
- 2) Various training vehicles
- 3) Smart classroom
- 4) Distance education technologies

**Method of Instruction**

- 1) Lecture and demonstration are both synchronous and asynchronous. Students are required to attend all lectures and participate with the instructor and other students during live formative assessments. Students will have access to recorded tests.
- 2) Individual assistance by file sharing, computer sharing, live demonstration of project based methods for diagnosing and repairing vehicles.
- 3) Remote assistance where a student controls the computer system from a distance.

**Out-of-Class Assignments**

- 1) **Reading:** assigned course materials, manuals, content on websites, and more.
- 2) **Writing:** assignments where students describe the required tasks related to diagnosis, replacement, repair, and testing of suspension systems and components, and more.
- 3) **Other:** web-based training modules (pass online pretests prior to laboratory "Test Out"), portfolio performance projects related to suspension systems and components, and more.

**Texts and References**

- 1) Required (representative examples):
  - a. Student workbooks – will be provided electronically.
  - b. Required: VanGelder, Kirk. Fundamentals of Automotive Technology. Jones and Bartlett Learning, 2023.
  - c. Web Based Training Modules will be provided electronically.
  - d. Workshop Manuals will be provided electronically.
- 2) Supplemental: None

**Student Learning Outcomes**

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

- 1) Accurately demonstrate, describe, and repair various suspension and steering system conditions.
- 2) Resolve suspension and steering problems by navigating the workshop manual based on symptoms and taking corrective actions.
- 3) Communicate effectively and professionally in a diverse setting that includes prospective colleagues, clients, and supervisors.
- 4) Comply with environmental health and safety regulations at the state and federal levels.