

CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 145 – ADVANCED FOUR WHEEL ALIGNMENT

3 hours lecture, 6 hours laboratory, 5 units

Catalog Description

Advanced course in four wheel alignment emphasizing diagnosis and complete suspension system repair. Designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-4 Certification.

Prerequisite

AUTO 140

Entrance Skills

Without the following skills, competencies and/or knowledge, any student entering this course will be highly unlikely to succeed:

- 1) Understand steering and suspension concerns, with ability to determine necessary action
- 2) Ability to diagnose and repair/replace power steering system components
- 3) Ability to test and diagnose electronically controlled systems
- 4) Ability to diagnose and repair/replace front and rear suspension systems and components
- 5) Ability to adjust and replace front and rear wheel bearings
- 6) Ability to diagnose and adjust vehicle alignment settings to industry standard
- 7) Ability to diagnose and adjust or replace wheel and tire components to industry standard

Course Objectives

Students will be able to:

- 1) Acquire safe working habits
- 2) Relate four wheel alignment and tire balancing theory to practical application
- 3) Perform suspension system repairs, alignments and tire balancing to prescribed industry standards

Special Materials Required of Student

- 1) Basic hand tool set
- 2) Approved safety glasses
- 3) Specialized alignment tools
- 4) Notebook, required textbook

Minimum Instructional Facilities

- 1) Auto tech lab (6 bays)
- 2) Complete four wheel alignment center
- 3) Computer tire balance equipment
- 4) Specialized alignment and suspension repair tools
- 5) Automotive transparencies, PowerPoint presentations, CD/DVD videos
- 6) VCR/monitor
- 7) SMART classroom

Course Content

- 1) Lecture:
 - a. Introduction and safety
 - b. Equipment operation
 - c. Suspension theory and design
 - d. Advanced alignment procedures
 - e. Advanced suspension component repair and replacement
 - f. Power steering control systems – advanced diagnosis

- g. Testing and diagnosis of electronically controlled steering systems
 - h. Tire and wheel design
 - i. Tire balancing principles
 - j. Four wheel steering systems
- 2) Lab:
- a. Introduction and safety
 - b. Laboratory procedures
 - c. Equipment operation
 - d. Pre-alignment checks
 - e. Diagnosis of difficult to solve tire balancing problems
 - f. Advanced alignment procedures
 - g. Advanced suspension component diagnosis, repair and replacement
 - h. Power steering system repair and adjustment
 - i. Testing and diagnosis of electronically controlled steering systems
 - j. Alignment of four wheel steer cars

Method of Instruction

- 1) Lecture and demonstration
- 2) Individual assistance

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes and written exams
- 2) Observation of student work
- 3) Inspection of work completed
- 4) Hands-on performance exam

Texts and References

- 1) Required: Pearson, Automotive Steering, Suspension and Alignment, 3rd edition. Prentice Hall, 2003.
- 2) Supplemental: None