CUYAMACA COLLEGE
OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 140 – FOUR WHEEL ALIGNMENT

3 hours lecture, 6 hours laboratory, 5 units

Catalog Description
Four wheel alignment principles as applied to checking and correcting alignment settings. Repair and replacement of suspension components, computerized steering and ride controls. Additional training in wheel balancing. Emphasis on practical experience on "live" automobiles. 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
None

Course Objectives
Students will be able to:
1) Distinguish between safe and unsafe working conditions
2) Synthesize alignment theory principles and apply that knowledge toward diagnosing alignment problems
3) Evaluate tire wear on vehicles and evaluate the possible need to choose alignment angle setting different from those in manufacturer's specifications
4) Formulate a working knowledge of vehicle pull concerns and select appropriate corrective change

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. Alignment procedures
   e. Suspension component repair and replacement
   f. Manual steering control systems
   g. Power steering control systems
   h. Testing and diagnosis of electronically controlled steering systems
   i. Tire and wheel design
   j. Tire balancing principles
   k. Four wheel steering systems
   l. Operation of computerized steering and ride controls

2) Lab:
   a. Introduction and safety
   b. Laboratory procedures
   c. Equipment operation
   d. Pre-alignment checks
   e. Tire balancing
   f. Alignment procedures
   g. Suspension components diagnosis, repair and replacement
   h. Manual steering system repair and adjustment
   i. Power steering system repair and adjustment
   j. Testing and diagnosis of electronically controlled steering systems
   k. Tire and wheel care
   l. Alignment of four wheel steer cars
   m. Diagnosis and repair of computerized steering and ride controls

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

Exit Skills
Students having successfully completed this course exit with the following skills, competencies and/or knowledge:
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 steering 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