

CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 176 – ENGINE MACHINING

3 hours lecture, 6 hours laboratory, 5 units

Catalog Description

Third course in the engine repair sequence. Student must have credit in the engine overhaul and advanced engine overhaul prior to enrolling in this course. Topics include cylinder boring and honing, rod resizing, replacing valve guides and seats, thread repair, king-pin fitting, replacing wheel studs, pressing bearings, etc. Designed to prepare students for employment in the automotive machine shop field. Preparation for ASE Engine Machinist exams.

Prerequisite

AUTO 175

Entrance Skills

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

- 1) Ability to independently perform all engine disassembly, wear diagnosis, precision measurement, and engine reassembly.
- 2) Ability to perform all required cylinder head machining/repair procedures

Course Objectives

Students will be able to:

- 1) Distinguish between safe and unsafe working conditions
- 2) Choose appropriate machine techniques for various engine repairs
- 3) Learn to assess amount of engine wear and judge reparability of components
- 4) Develop skill and demonstrate their ability at boring and honing engine blocks
- 5) Demonstrate proper use of bearing press, precision hone, seat and guide repair and replacement

Special Materials Required of Student

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

Minimum Instructional Facilities

- 1) Auto tech lab (6 bays)
- 2) Complete engine service equipment center
- 3) Various training models
- 4) Engine machining room
- 5) Engine assembly room (clean room)
- 6) Automotive transparencies, PowerPoint presentations, CD/DVD videos
- 7) Classroom with projection screen, VCR/monitor
- 8) SMART classroom

Course Content

- 1) Lecture:
 - a. Introduction and safety
 - b. Part inspection
 - c. Engine cleaning
 - d. Engine measurements
 - e. Pan fitting
 - f. Bearing replacement
 - g. Advanced cylinder head repair

- 2) Lab:
 - a. Introduction and safety
 - b. Laboratory procedures
 - c. Equipment operation
 - d. Boring bar set-up
 - e. Cylinder hone set-up and operation
 - f. Seat and guide replacement
 - g. Bearing replacement
 - h. Stud replacement
 - i. Thread repair

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: Hughes, Automotive Engine Rebuilding. 2nd edition. Prentice Hall, 2003.
- 2) Supplemental: None