

CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 170 – ENGINE OVERHAUL

3 hours lecture, 6 hours laboratory, 5 units

Catalog Description

Diagnosis of engine failures, engine removal and disassembly techniques, engine cleaning and measuring practices, machining principles and assembly procedures. Emphasis on practical experience through actual shop training. Students are required to provide an auto engine for overhaul. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-1 Certification.

Prerequisite

None

Course Objectives

Students will be able to:

- 1) Acquire safe working habits
- 2) Relate engine operating theory for practical application
- 3) Perform engine repairs to prescribed industry standards

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. Engine systems
 - c. Engine removal
 - d. Engine disassembly
 - e. Part inspection
 - f. Engine cleaning and machining
 - g. Engine measuring (“mike-up”)
 - h. Cylinder head repair
 - i. Cylinder block preparation
 - j. Pre-assembly checks
 - k. Assembly procedures
 - l. Engine installation
- 2) Lab:
 - a. Introduction and safety
 - b. Laboratory procedures
 - c. Equipment operation

- d. Engine removal
- e. Disassembly procedures
- f. Cleaning operations
- g. Part inspection and measurements
- h. Block preparation
- i. Cylinder head and valve servicing
- j. Pre-assembly checks
- k. Assembly procedures
- l. Engine installation

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

Texts and References

- 1) Required: Hughes, Automotive Engine Rebuilding. 2nd 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 nomenclature and operational theory of automotive engines
- 2) Ability to diagnose engine noise and mechanical problems
- 3) Ability to remove and install engine
- 4) Ability to correctly disassemble and reassemble an automotive engine
- 5) Ability to measure all critical engine components for size and wear
- 6) Ability to diagnose and repair cylinder head and valve train components
- 7) Ability to diagnose, inspect and repair lubrication system components
- 8) Understand process and procedure for performing various engine machining operations