

## CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

### **AUTOMOTIVE TECHNOLOGY 175 – ADVANCED ENGINE OVERHAUL**

3 hours lecture, 6 hours laboratory, 5 units

#### **Catalog Description**

Advanced course in engine overhaul 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-1 Certification.

#### **Prerequisite**

AUTO 170

#### **Entrance Skills**

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

- 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

#### **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 block preparation
  - i. Pre-assembly checks
  - j. Assembly procedures
  - k. Engine installation
- 2) Lab:
- a. Introduction and safety
  - b. Laboratory procedures
  - c. Equipment procedures
  - d. Equipment operation
  - e. Engine removal
  - f. Disassembly procedures
  - g. Cleaning operations
  - h. Part inspection and measurements
  - i. Block preparation
  - j. Cylinder head and valve servicing
  - k. Pre-assembly checks
  - l. Assembly procedures
  - m. 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. 2<sup>nd</sup> 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) 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