

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**AUTOMOTIVE TECHNOLOGY 193 – ASSET–ENGINE REPAIR**

3 hours lecture, 4.5 hours laboratory, 4.5 units

**Catalog Description**

Ford ASSET course to include diagnosis of engine failures, engine removal and disassembly techniques, engine cleaning and measuring practices, machining principles, assembly procedures and in-car repairs. Engine design theory will be discussed. Preparation for ASE Certification. Complemented by required work experience in the dealership.

**Prerequisite**

None

**Course Content**

- 1) Lecture:
  - a. Introduction and safety
  - b. Equipment operation
  - c. Engine systems
  - d. Engine failure diagnosis
  - e. In-vehicle repair
  - f. Engine removal
  - g. Engine disassembly
  - h. Precision measuring devices
  - i. Cleaning and inspection of parts
  - j. Cylinder head diagnosis and repair
  - k. Engine assembly and 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 measurement
  - h. Cylinder head and valve servicing
  - i. Assembly procedures
  - j. Engine installation
  - k. Pre-oiling and start-up procedures

**Course Objectives**

Students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling procedures.
- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair.
- 3) Perform intrusive and non-intrusive engine tests, interpret results and prescribe appropriate repair.
- 4) Remove and replace engine and engine sub-assemblies following proper manufacturer procedures.
- 5) Disassemble, measure and interpret results, and prescribe correct repair of worn engine components.

**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, written exams, and hands-on performance exam that measure students' ability to safely identify necessary action or repair, diagnose and measure modern automotive engines, and perform necessary tasks related to engine repair.
- 2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing and adjustment of modern automotive engines.
- 3) Skills-based summative assessment that measures students' ability to successfully complete the necessary NATEF tasks related to diagnosis, replacement, repair, testing and adjustment of drive train systems and components.

**Special Materials Required of Student**

- 1) Mechanic's hand tool set
- 2) Approved safety glasses
- 3) Specialized engine repair tools

**Minimum Instructional Facilities**

- 1) Auto tech lab (6 bays)
- 2) Smart classroom
- 3) Various training vehicles, engines
- 4) Engine assembly room

**Method of Instruction**

- 1) Lecture and demonstration
- 2) Individual assistance

**Out-of-Class Assignments**

- 1) Reading assignments
- 2) Writing assignments

**Texts and References**

- 1) Required (representative example): None
- 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) Diagnose engine noise and mechanical problems.
- 3) Remove and install engine.
- 4) Correctly disassemble and reassemble an automotive engine.
- 5) Measure all critical engine components for size and wear.
- 6) Diagnose and repair cylinder head and valve train components.
- 7) Diagnose, inspect and repair lubrication system components.
- 8) Understand process and procedure for performing various engine machining operations.

**Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling procedures.
- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair using assigned lab sheets and hands-on testing.

- 3) Perform intrusive and non-intrusive engine tests, interpret results, and prescribe appropriate repair using assigned lab sheets and hands-on testing.