



## COURSE SYLLABUS

1. **TITLE OF COURSE:** ENGINE, DISASSEMBLY DIAGNOSIS, and ASSEMBLY  
**PREFIX/NUMBER:** ASE 161    **CREDIT HOURS:** 5 CR. (1L/6 LBV)
2. **PREREQUISITE:**
3. **RESOURCES NEEDED:**
  - TEXT:**
  - SUPPLIES:** Tools as listed on the Auto Shop Tool List
4. **COURSE DESCRIPTION:** Focuses on lecture and laboratory experiences in the disassembly, diagnosis and reassembly of the automotive engine. Topics include the diagnostic and repair procedures for the engine block and head assemblies.
5. **COURSE GOAL:** To provide laboratory experience on vehicles with a variety of work in the areas which each student has received training during previous classes.
6. **COURSE OBJECTIVES:**

By the end of the course, students will:

  - (A) Remove cylinder head(s); visually inspect cylinder head(s) for cracks; gasket surface areas for warpage and leakage; check passage condition.
  - (B) Install cylinder head(s) and gasket(s); tighten according to manufacturer's specifications and procedures.
  - (C) Inspect and test valve springs for squareness, pressure, and free height comparison; replace as needed.
  - (D) Inspect valve spring retainers, locks, and valve grooves.  
Replace valve stem seals.
  - (E) Inspect valve guides for wear, check valve-guide height and stem-to-guide clearance; recondition or replace as needed.
  - (F) Resurface valves, perform necessary action.
  - (G) Resurface valve seats; perform necessary action.
  - (H) Check valve face-to-seat contact and valve seat concentricity (run-out); service seats and valves as needed.
  - (I) Check valve spring assembled height and valve stem height; service valve and spring assemblies as needed.

- (J) Inspect push rods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine necessary action.
- (K) Inspect hydraulic or mechanical lifters; replace as needed.
- (L) Adjust valves (mechanical or hydraulic lifters).
- (M) Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); replace as necessary.
- (N) Inspect and replace timing belt(s), overhead cam-drive sprockets, and tensioners, check belt tension, adjust as necessary.
- (O) Inspect camshaft for run-out, journal wear and lobe wear.
- (P) Inspect and measure camshaft bearings for damage, out-of-round, and alignment; determine necessary action.
- (Q) Verify camshaft(s) timing according to manufacturer's specifications and and procedure.
- (R) Inspect and replace pans, covers, gaskets, and seals.
- (S) Inspect engine block for cracks, passage condition, core and gallery plug condition, and surface warpage; determine necessary action.
- (T) Inspect internal and external thread's repair as needed (includes installing thread inserts).
- (U) Remove cylinder wall ridges.
- (V) Inspect and measure cylinder walls for damage and wear, determine necessary action.
- (W) Deglaze and clean cylinder walls.
- (X) Inspect crankshaft for surface cracks and journal damage; check oil passage condition; measure journals; determine necessary action.
- (Y) Inspect and measure main and connecting rod bearings for damage, clearance, and end play; determine necessary action (includes the proper selections or bearings.).
- (Z) Identify piston and bearing wear patterns that indicate connecting rod alignment and bearing bore problems; inspect rod alignment and bearing bore condition.
- (AA) Inspect, measure, and service pistons and pins; determine necessary action.
- (BB) Inspect, measure, and install piston rings.
- (CC) Inspect, repair or replace crankshaft vibration damper (harmonic balancer).
- (DD) Reassemble engine components using correct gaskets and sealants.
- (EE) Inspect auxiliary (balance, intermediate, idler, counterbalance or silencer) shaft(s); inspect shaft(s) and support bearings for damage and wear; determine needed repairs; reinstall and time.

## 7. EVALUATION PROCEDURES:

- (A) There will be a written exam after each unit and a final, during the 7½ week

term, during class time, and on announced dates. All will be weighted equally, except the final will count double.

- (B) There may be unannounced "pop" quizzes throughout the 7½ week term, which will also be weighted equally to other exams.
- (C) Routine evaluations will be made on an individual basis by the instructor during each lab session.
- (D) There will be a lab final (performance) exam. The score on this exam will be entered twice (doubled) when computing your final grade.
- (E) Grading will be weighted--30% of your grade for written assignments, 40% of your grade for lab assignments, 30% of your grade for tests. One grade point value will be deducted from total grade percentage.

Written Assignments 30%	Lab Assignments 40%	Tests 30%	Attendance
50/50	50/38	100/90	One point will be deducted from total grade percentage for each hour absent
50/38	50/50	100/70	
50/50	50/38	100/90	
150/138	150/126	300/250	

#### Special Remarks:

1. This is a straight lab class with a variety of work assignments available to each student, depending upon his/her choice of topic for this class. All students will be picked up at a point or level of skills, knowledge, speed, etc., compatible with their previous work. All students will be expected to expand their work skills and improve the quality and quantity of work performed, diagnostic procedures, etc., in their selected area of automobile repair.
2. Make-up quizzes and exams will be made only through arrangements prior to test day.
3. Attendance Policy: Attendance and punctuality enter into your final grade. Absences in excess of 20% of total class time will result in being dropped from this class. Three tardies equals one absence. Three absences will lower your final grade by one letter.
4. Lab assignments may require some outside research or study. You are encouraged to be prepared for the assigned lab projects when you come to class.
5. The PCC catalog for the year in which you started this program lists all general academic policies, procedures, and requirements relating to your enrollment and education. It is your responsibility to read, understand, and follow that catalog as it relates to you.

#### 8. COURSE OUTLINE:

- I. Engine Disassembly
- II. Cylinder Head and Valve Train Diagnosis and Repair
- III. Engine Block Assembly Diagnosis and Repair
- IV. Run Engine and Perform Adjustments

This class is strictly a laboratory class to provide students with supervised, hands-on

experience in the areas of automotive repair for which they have received instruction

Jobs scheduled into the shop or lab will be assigned in an attempt to provide each student with a variety of work in the area of automobile repair that they have received training.

The quantity and variety of work accepted into class will be dependent upon the available work (number and variety), the skill level, and variety of the student and the space and/or equipment available for work.

In all likelihood, more than one student will be assigned to each job. Once a job is started the student or students assigned to that project are expected to follow the job through to completion. Regular and prompt attendance is expected.

In general, the jobs accepted in class must fall into the following areas and/or criteria:

- (A) Electrical
- (B) Minor engine work
- (C) Valve jobs

Conditions of Service:

- (A) Vehicle must be ten years old or less and be compatible with our instruction.
- (B) All work is performed by students and supervised by an instructor - no completion time or date will be promised.
- (C) We furnish all parts, which will be billed at full suggested retail price - payable when work is completed.

#### **9. METHODS OF INSTRUCTION:**

To be successful in this course, students are expected to participate in discussions, readings, in-class writing, and peer review activities. The instructor may assign point values to such activities.

#### **10. ACADEMIC INTEGRITY:**

The very nature of higher education requires that students adhere to accepted standards of academic integrity. Therefore, Pueblo Community College has adopted a policy of academic conduct as described in the Student Handbook. Violation of academic integrity may be defined to include the following: cheating, plagiarism, falsification and fabrication, abuse of academic materials, complicity in academic dishonesty, and personal misrepresentation. It is the student's responsibility to be aware of the behaviors that constitute academic dishonesty. Sanctions for violating the standards of academic integrity may include warning, probation, suspension, and/or failure of the course or assignment at the discretion of the instructor.

#### **11. ADA NOTICE:**

Students who have a documented disability may be eligible to receive accommodations for this class. Please contact the Disability Resources Center at 549-3446 for further information.