SYLLABUS

Division: Business & Engineering Technologies **REVISED: Fall Semester 2012**
Curricula in Which Course is Taught: **Automotive Analysis & Repair**
Course Number and Title: **AUT 114 Cylinder Head Service**
Course Credits 3 **Lecture 2 Hours/Week** **Laboratory 3 Hours/Week**

I. Course Description:

Studies cylinder head reconditioning, including valve seat grinding, refacing valves, servicing valve guides, valve seat inserts, cutting for valve seals and springs; thread repair and resurfacing mating surfaces.

II. Relationship of the Course to Curriculum Objectives:

Students will:

I. **demonstrate technical competencies & skills in automotive cylinder head repair**
II. **demonstrate punctuality & reliability acceptable to the auto repair industry**
III. **use safety equipment & procedures required for the tasks being performed**
IV. **read & interpret technical information required for projects & assignments**
V. **demonstrate and maintain a clean, orderly, safe & attractive work place & maintain a personal appearance that will enhance that work place**

III. Requirements:

Textbook: Modern Automotive Technology by James E. Duffy, latest addition, published by Goodheart-Willcox. The student must have work clothes and a tool set available each day.

IV. Course Objectives-ASEtask list:

Remove & inspect cylinder heads, visuallly check for cracks; check for warpage
Install cylinder head to cylinder block at manufacturer's specified torque
Inspect & test valve springs for squareness, pressure & free height; relace if needed
Replace valve stem seals; inspect spring retainers, locks and valve grooves
Inspect valve guides for wear; check stem to guide clearance
Inspect valves and valve seats; grind or replace
Check valve face-to-seat contact and concentricity
Check valve spring installed height and stem height; correct
Inspect pushrods, rocker arms & rocker arm pivots, shafts & oil passages
Inspect hydraulic or mechanical lifters
Adjust valves with hydraulic or mechanical lifters
Inspect & replace camshaft drive: timing chain or gears
Inspect and replace timing belts or chains on OHC assembly
Inspect camshaft for runout, journal and lobe wear
Inspect cam bearings for wear, damage, out-ot-round or misalignment
Establish camshaft timing and cam sensor indexing according to specifications

V. Learner Outcomes:

evaluated by multiple choice, fill in the blank or true/false tests:

1. **diagnose valve guide wear problems**
2. **diagnose compression loss due to valve failure**
3. **diagnose blown head gasket problems**
4. **diagnose the need to replace valve seats or guides**
5. **diagnose engine valve train failure**

VI. **Evaluation: by active participation in team projects:**

6. **participate in the removal & disassembly of a cylinder head**
7. **participate in the testing of valve springs**
8. **participate in the grinding of valve seats and faces**
9. **participate in the machine work necessary to recondition cylinder heads**
10. **participate in identification of warped or straight cylinder heads**
11. **75% of the students will be able to complete these assignments**

VI. The following General Education Objectives will be addressed in this course:

__X__ **Communications**

__X__ **Learning Skills**

__X__ **Critical Thinking**

_____ **Interpersonal Skills and Human Relations**

__X__ **Computational and Computer Skills**

_____ **Understanding Culture and Society**

__X__ **Understanding Science and Technology**

_____ **Wellness**