COURSE OUTLINE

Auto 113 – Engine Performance 1

Prepared By: Kenneth Wurster
A. **TITLE:** ENGINE PERFORMANCE I

B. **COURSE NUMBER:** AUTO 113

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** NO

E. **COURSE LENGTH:** 15 WEEKS

F. **SEMESTER(S) OFFERED:** SPRING

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**

3 LECTURE HOURS PER WEEK

H. **CATALOG DESCRIPTION:** With the completion of this course, the student will be able to diagnose a performance condition resulting from an engine mechanical, fuel or ignition problem. Students will analyze engine mechanical condition, such as cylinder compression, cylinder leakage, and valve timing issues. In the engine ignition and fuel delivery systems, students will diagnose using electronic computer based scanners, digital multimeters, oscilloscopes and other diagnostic devices.

I. **PRE-REQUISITES/CO-REQUISITES:**

   a. Pre-requisite(s): AUTO 101 or MSPT 101, and AUTO 112, AUTO 122
   b. Co-requisite(s): AUTO 114

J. **GOALS (STUDENT LEARNING OUTCOMES):**

   By the end of this course, the student will be able to:

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<th>Course Objective</th>
<th>Institutional SLO</th>
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<tr>
<td>a. Demonstrate knowledge and understanding of distributor ignition systems.</td>
<td>2. Crit. Thinking 3. Prof. Competence</td>
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<td>b. Demonstrate procedures necessary in servicing engine ignition systems.</td>
<td>2. Crit. Thinking 3. Prof. Competence</td>
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<td>c. Demonstrate knowledge and understanding of engine fuel injection systems, both mechanical and electronic.</td>
<td>2. Crit. Thinking 3. Prof. Competence</td>
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<td>d. Demonstrate procedures necessary in servicing fuel injection systems.</td>
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<td>e. Apply electrical knowledge to engine performance sensors and the modules that control them.</td>
<td>2. Crit. Thinking 3. Prof. Competence</td>
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L. REFERENCES: Alldata, ShopKey.

M. EQUIPMENT: Technology Enhanced Classroom

N. GRADING METHOD: A-F

O. MEASUREMENT CRITERIA/METHODS:
   - Exams
   - Quizzes
   - Participation

P. DETAILED COURSE OUTLINE: (must use the outline format listed below)

   I. INTRODUCTION
      A. Course overview
      B. Course requirements

   II. ENGINE CONDITION DIAGNOSIS
      A. Compression
      B. Cylinder Leakage
      C. Cylinder Balance

   III. BASICIGNITION OVERVIEW
      A. Ignition system components
      B. Ignition system operation
      C. Points and condensers

   IV. PRIMARY SWITCHING
      A. Pickup coil (pulse generator)
      B. Hall Effect switch
      C. Magnetic crankshaft position sensors
      D. Optical sensors (light emitting diodes - LED)

   V. IGNITION SECONDARY SYSTEMS
      A. Secondary windings of a coil
      B. Distributor cap and rotor if equipped
      C. Spark plug wires and spark plugs

   VI. FUEL SYSTEM INTRODUCTION
      A. Operating principles/requirements
      B. Stoichiometry

   VII. FUEL DELIVERY SYSTEMS
      A. Mechanical Systems
      B. Electrical Systems

   VIII. COMPUTERIZED ENGINE CONTROL
      A. Operating principles/requirements
      B. Interaction of system components
      C. Electronic system service procedures

Q. LABORATORY OUTLINE: NONE