COURSE OUTLINE

AUTO 114 - ENGINE PERFORMANCE I LABORATORY

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CANINO SCHOOL OF ENGINEERING TECHNOLOGY
AUTOMOTIVE TECHNOLOGY
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A. **TITLE:** Engine Performance I Laboratory

B. **COURSE NUMBER:** AUTO 114

C. **CREDIT HOURS:** 1

D. **WRITING INTENSIVE COURSE:** NO

E. **COURSE LENGTH:** 15 weeks

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

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   3 hour lab per week

H. **CATALOGUE DESCRIPTION:** The laboratory component of this course consists of hands-on activities involving theories learned in the classroom. Students use service information, while testing systems with digital volt/ohm meters and computer scanners. Fuel and powertrain control systems are diagnosed with the latest tools available. With the completion of both components of Engine Performance I, (AUTO 113 and AUTO 114) students will be able to diagnose and repair a vehicle with a no-start condition resulting from a fuel or ignition problem. The student will be able to access vehicle computer information, including inputs, outputs, and miscellaneous tests.

I. **PRE-REQUISITES/CO-COURSES:**
   a. Pre-requisite(s): AUTO 101 or MSPT 101, and AUTO 112
   b. Co-requisite(s): AUTO 113

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

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<th>Course Objective</th>
<th>Institutional SLO</th>
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<td>Apply electrical knowledge to engine performance sensors and the modules that control them.</td>
<td>2. Crit. Thinking 3. Profess. Comp.</td>
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K. **TEXTS:** NATEF Standards Job Sheets, Engine Performance by Jack Erjavec

L. **REFERENCES:** Shop manuals of manufacturers, Mitchell manuals, All Data, General Motors EST. Subaru STIS
M. **EQUIPMENT:** Standard automotive required equipment

N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:** Laboratory performance tests, attendance

P. **DETAILED TOPICAL OUTLINE:**

1. **Orientation**
   a. Overview
   b. Safety

2. **Use of Specification/Service Manuals - Assessment of Service/Repair Information**
   a. Introduction to manual usage
      1. Manufacturer’s manuals
      2. Aftermarket manuals
   b. CD Rom, All data, GM Electronic Service Training
   c. Simulate no start use of service manuals/CD Rom to diagnose

3. **Ignition Theory of Operation**
   a. Ignition service safety
   b. Identification and testing of system components
   c. Primary/Secondary circuit testing and service
   d. Timing and test adjustment with electronic controls

4. **Ignition Timing**
   a. Component location
   b. Distributor removal and reinstallation
   c. Breaker point and solid state overhaul procedures
   d. Static timing

5. **Electronic Circuit Review**
   a. Electrical Safety
   b. Tracing specific circuits
   c. Specifications and service procedures
   d. Trouble shooting
   e. Wire/connector Repair

6. **Electronic Engine Control**
   a. Troubleshooting principles
   b. Electronic system service procedures (testing inputs with DVOM)
   c. Self-diagnostic systems
   d. Manufacturer-specific systems testing
   e. Automatic system testers (scanners)

7. **Performance Testing**
   a. Live skills performance oriented test
   b. Note: performance test will be given randomly
8. Fuel Delivery Systems
   a. Fuel infection systems orientation
   b. Fuel pump testing-pressure/volume
   c. Fuel injector balance and resistance
   d. Testing fuel pump current draw

9. Computer Scanning
   a. Inputs and outputs (different scan tools)
   b. Miscellaneous tests
   c. Oxygen sensor diagnostics

10. Compression Testing, Cylinder Leakage
    a. Compression testing - wet/dry
    b. Use of Snap-On Leak Detector
    c. Problem Analysis