MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
AUTO 113 – ENGINE PERFORMANCE I

Created by: Christopher Mayville
Updated by: Brandon Baldwin

Canino School of Engineering Technology
Department: Automotive Technology
Semester/Year: Spring 2018
A. **TITLE:** Engine Performance I

B. **COURSE NUMBER:** AUTO 113

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

- # Credit Hours: 3
- # Lecture Hours: 3 per week
- # Lab Hours: per week
- Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes ☑ No ☐

E. **GER CATEGORY:** None: ☐ Yes: GER ☑
   
   *If course satisfies more than one:* GER ☑

F. **SEMESTER(S) OFFERED:** Fall ☐ Spring ☑ Fall & Spring ☐

G. **COURSE 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.

H. **PRE-REQUISITES:** None ☐ Yes ☑ If yes, list below:

   AUTO 101 or MSPT 101, and AUTO 112, AUTO 122

   **CO-REQUISITES:** None ☐ Yes ☑ If yes, list below:

   AUTO 114
I. **STUDENT LEARNING OUTCOMES: (see key below)**

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

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<td>Demonstrate knowledge and understanding of distributor ignition systems.</td>
<td>ALO1, ALO2, ALO3</td>
<td>2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills</td>
<td>CA IA PS IM</td>
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<td>Demonstrate procedures necessary in servicing engine ignition systems.</td>
<td>ALO1, ALO2, ALO3</td>
<td>2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills</td>
<td>CA IA PS IM</td>
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<td>Demonstrate knowledge and understanding of engine fuel injection systems, both mechanical and electronic.</td>
<td>ALO1, ALO2, ALO3</td>
<td>2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills</td>
<td>CA IA PS IM</td>
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<tr>
<td>Demonstrate procedures necessary in servicing fuel injection systems.</td>
<td>ALO1, ALO2, ALO3</td>
<td>2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills</td>
<td>CA IA PS IM</td>
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<td>Apply electrical knowledge to engine performance sensors and the modules that control them.</td>
<td>ALO1, ALO2, ALO3</td>
<td>2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills</td>
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<td>ISLO #</td>
<td>Communication Skills</td>
<td>Critical Thinking</td>
<td>Foundational Skills</td>
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<td>Oral [O], Written [W]</td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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</tbody>
</table>

*Include program objectives if applicable. Please consult with Program Coordinator!
J. **APPLIED LEARNING COMPONENT:** Yes ☑ No ☐

If YES, select one or more of the following categories:

☑ Classroom/Lab ☑ Internship ☑ Clinical Placement ☐ Practicum ☑ Service Learning ☐ Community Service

☐ Civic Engagement ☑ Creative Works/Senior Project ☑ Research ☐ Entrepreneurship (program, class, project)

K. **TEXTS:**


L. **REFERENCES:**

Alldata, ShopKeyPro, Subaru STIS.

M. **EQUIPMENT:** None ☐ Needed: Technology Enhanced Classroom

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

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

• Exams
• Quizzes
• Participation

P. **DETAILED COURSE OUTLINE:**

I. **INTRODUCTION**
A. Course overview
B. Course requirements

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

III. **BASIC IGNITION 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 ☒ Yes ☐