

**STATE UNIVERSITY OF NEW YORK  
COLLEGE OF TECHNOLOGY  
CANTON, NEW YORK**



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
AUTO 114 – ENGINE PERFORMANCE I LABORATORY**

**Created by: Brandon Baldwin**

**Updated by: Brandon Baldwin**

**Canino School of Engineering Technology**

**Department: AUTOMOTIVE TECHNOLOGY**

**Semester/Year: SPRING 2018**

A. **TITLE:** Engine Performance I Laboratory

B. **COURSE NUMBER:** AUTO 114

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

# Credit Hours: 1

# Lecture Hours:     per week

# Lab Hours: 3 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:**

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.

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

AUTO 101 or MSPT 101, and AUTO 112

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

AUTO 113

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

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

<b><u>Course Student Learning Outcome</u></b> <b><u>[SLO]</u></b>	<b><u>Program Student Learning Outcome</u></b> <b><u>[PSLO]</u></b>	<b><u>GER</u></b> <i>[If Applicable]</i>	<b><u>ISLO &amp; SUBSETS</u></b>	
Demonstrate knowledge and understanding of distributor ignition systems	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Demonstrate procedures necessary in servicing engine ignition systems	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Demonstrate knowledge and understanding of engine fuel injection systems, both mechanical and electronic.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Demonstrate procedures necessary in servicing fuel injection systems.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Apply electrical knowledge to engine performance sensors and the modules that control them.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Interpret scan tool data to diagnose engine performance problems	ALO1, ALO2, ALO3		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets

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<b>KEY</b>	<b><u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u></b>
<b>ISLO #</b>	<b>ISLO &amp; Subsets</b>
<b>1</b>	<b>Communication Skills</b> Oral [O], Written [W]
<b>2</b>	<b>Critical Thinking</b> <i>Critical Analysis [CA] , Inquiry &amp; Analysis [IA] , Problem Solving [PS]</i>
<b>3</b>	<b>Foundational Skills</b> <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
<b>4</b>	<b>Social Responsibility</b> <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
<b>5</b>	<b>Industry, Professional, Discipline Specific Knowledge and Skills</b>

\*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:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement              |
| <input type="checkbox"/> Internship               | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement       | <input type="checkbox"/> Research                      |
| <input type="checkbox"/> Practicum                | <input type="checkbox"/> Entrepreneurship              |
| <input type="checkbox"/> Service Learning !       | (program, class, project)                              |
| <input type="checkbox"/> Community Service        |  |

K. - **TEXTS:**

NATEF Standards Job Sheets, Engine Performance by Jack Erjavec

L. - **REFERENCES:**

ShopKeyPro, AllData, Subaru STIS

M. - **EQUIPMENT:** None  Needed: Snap-On Scanners, student tool list

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

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

lab practical, lab performance

P. **DETAILED COURSE 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 injection 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**

Q. **LABORATORY OUTLINE:** None  Yes

**This is a laboratory class.**