

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



**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:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO &amp; SUBSETS</u>	
Demonstrate knowledge and understanding of distributor ignition systems.	ALO1,ALO2,ALO3		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA PS IM
Demonstrate procedures necessary in servicing engine ignition systems.	ALO1,ALO2,ALO3		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA PS IM
Demonstrate knowledge and understanding of engine fuel injection systems, both mechanical and electronic.	ALO1,ALO2,ALO3		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA PS IM
Demonstrate procedures necessary in servicing fuel injection systems.	ALO1,ALO2,ALO3		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA PS IM
Apply electrical knowledge to engine performance sensors and the modules that control them.	ALO1,ALO2,ALO3		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA PS IM
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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:**

Halderman, James D. Automotive Electrical and Engine Performance, 7th. Edition, Pearson Education, 2016.

Supplement book: AUTO 113/MSPT 113 booklet, ISBN 10: 1323722521, ISBN 13: 9781323722527

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**