

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
AUTO 213 – ENGINE PERFORMANCE II**

Created by: Brandon Baldwin

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Canino School of Engineering Technology !

Department: AUTOMOTIVE TECHNOLOGY !

Semester/Year: FALL 2018 !

- A. **TITLE:** Engine Performance II
- B. **COURSE NUMBER:** AUTO 213
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 4
Lecture Hours: 3 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:**

This course begins where Engine Performance I terminates. Sophisticated engine control systems are studied which include distributorless ignition, electronic spark control and emission control. The student learns and applies knowledge of the integration of the above systems and powertrain/engine control computer (PCM). Diagnosis and repair includes test equipment such as digital volt-ohm meters, oscilloscopes, and interactive computer scanners. Students continually utilize the latest automotive reference materials in diagnosis and repair procedures

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

AUTO 112, AUTO 122, AUTO 113, AUTO 114

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

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 & SUBSETS</u>	
Describe the operation of OBD II light duty diagnostic systems.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Describe how OBD II trouble codes are set, stored, and cleared.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Describe the different OBD II operation modes.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Access and utilize OBD II data including generic and global data.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Access, utilize, and clear OBD II trouble codes.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Retrieve and interpret scanner data	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets

Interpret trouble code diagnostic charts.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Interpret and diagnose the entire emissions system on computer controlled vehicles.	ALO1, ALO2		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

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

*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:**

Fuel and Emissions Control Systems, Halderman and Linder, Engine Performance, NATEF Standards job sheets, 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:**

Exams, quizzes, homework, lab practical, lab performance

P. **DETAILED COURSE OUTLINE:**

1. Review of Engine Performance I
2. On-Board Diagnostics
 - a. History
 - b. OBD II
3. Emission Control
 - a. History
 - b. Components
 - c. Diagnostics
4. PCM Diagnostics
 - a. Inputs
 - b. Outputs
 - c. Scanner usage
 - d. Digital Storage Scope
 - e. Freeze Frame
5. Precision Fuel Control
 - a. Short Term Fuel Trim
 - b. Long Term Fuel Trim

c. Trim Cells

Q. LABORATORY OUTLINE: None Yes

Same as class outline