

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



MASTER SYLLABUS

AUTO 213 ENGINE PERFORMANCE II

CIP Code: 47.0604

**Created by: Brandon Baldwin
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**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
AUTOMOTIVE TECHNOLOGY
FALL 2022**

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 Week

Other ___ per Week

Course Length (# of Weeks): 15

D. WRITING INTENSIVE COURSE: NO

E. GER CATEGORY: NONE

F. SEMESTER(S) OFFERED: FALL

G. COURSE DESCRIPTION:

This course begins where Engine Performance I terminates. Sophisticated OBD II engine control systems are studied which include Variable Valve Timing and Lift, Boost, and Emissions Controls. The student learns and applies knowledge of the integration of the above systems and powertrain/engine control computer (PCM). Diagnosis and repair include 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: AUTO 112, AUTO 122, AUTO 113, and AUTO 114

CO-REQUISITES: NONE

I. STUDENT LEARNING OUTCOMES:

<u>Course Student Learning Outcome [SLO]</u>	<u>PSLO</u>	<u>ISLO</u>	<u>Subsets</u>
Describe the operation of OBD II light duty diagnostic systems.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS
Describe how OBD II trouble codes are set, stored, and cleared.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS
Describe the different OBD II operation modes.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS

Access and utilize OBD II data including generic and global data.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	
Access, utilize, and clear OBD II trouble codes.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS
Retrieve and interpret scanner data	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS
Interpret trouble code diagnostic charts.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS
Interpret and diagnose the entire emissions system on computer-controlled vehicles.	ALO1, ALO2	2-Crit Thinking 5-Ind, Prof, Disc, Know Skills	CA, IA, PS

KEY	Institutional Student Learning Outcomes [ISLO 1 – 5]
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

J. APPLIED LEARNING COMPONENT: Yes x No

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

Classroom/Lab x
 Internship
 Clinical Practicum
 Practicum
 Service Learning
 Community Service

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

K. TEXTS: Halderman, James D., Automotive Engine Performance, 5th Edition, Pearson Education, 2016

L. REFERENCES: ShopKey Pro

M. EQUIPMENT: Snap-On scanners and student tool list

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS: Exams, quizzes, homework, lab practical, and lab performance

P. DETAILED COURSE OUTLINE:

1. Review of Engine Performance I
2. No-Start Diagnosis
3. On-Board Diagnostics
 - a. History
 - b. OBD II Standards
 - c. The 10 Modes of OBD II
4. Emission Control
 - a. History
 - b. Components
 - c. Diagnostics
5. PCM Diagnostics
 - a. Inputs
 - b. Outputs
 - c. Scanner usage
 - d. Digital Storage Scope
 - e. Freeze Frame
6. Precision Fuel Control
 - a. Short Term Fuel Trim
 - b. Long Term Fuel Trim
7. Variable Valve Timing and Lift Control
8. Boost and boost controls

Q. LABORATORY OUTLINE: Same as course outline