

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
MSPT 114 - Powersports Engine Diagnostics Laboratory**

Created by: Christopher Mayville

Updated by:

Canino School of Engineering Technology !

Department: Mechanical & Energy Technologies !

Semester/Year: Fall 2018 !

- A. **TITLE:** Powersports Engine Diagnostics Laboratory
- B. **COURSE NUMBER:** MSPT 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, both hard-copy and electronic, while testing systems with digital volt/ohm meters and computer scanners. Fuel and powertrain control systems are diagnosed with the latest tools available. Three hours laboratory per week. With the completion of both lecture and lab, (MSPT 113 and MSPT 114) students will be able to diagnose and repair a machine with a no-start condition resulting from a fuel or ignition problem. The student will be able to access computer information, including inputs, outputs, and miscellaneous tests.

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

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

MSPT 113-Powersports Engine Diagnostics, or with permission of instructor

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> | |
|---|--|---|----------------------------------|--|
| Demonstrate knowledge and understanding of ignition systems | | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| Demonstrate procedures necessary in servicing engine ignition systems | MSPT SO 1 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| Demonstrate knowledge and understanding of engine fuel injection systems | MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| Demonstrate procedures necessary in servicing fuel injection systems | MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| Apply electrical knowledge to engine performance sensors and the modules that control them. | MSPT SO 2, MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| Interpret data from diagnostic software to diagnose engine performance problems | MSPT SO 1, MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |

| | | | | |
|--|--|--|----------------------|--|
| | | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| | | | ISLO ISLO ISLO | Subsets Subsets Subsets 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:**

Instructor developed worksheets

L. **REFERENCES:**

Shop manuals of manufacturers

M. **EQUIPMENT:** None Needed: Standard repair equipment

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

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

Lab activities, performance tests, laboratory participation

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**
 - b. **Simulate no start, use service information 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. **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 (diagnostic software)**

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**
 - b. **Miscellaneous tests**
 - c. **Oxygen sensor diagnostics**

10. **Compression Testing, Cylinder Leakage**
 - a. **Compression testing - wet/dry**
 - b. **Use of leak detector**
 - c. **Problem Analysis**

Q. **LABORATORY OUTLINE:** None Yes