

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



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
MSPT 110 - Engine and Power Transmission Service**

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**Canino School of Engineering Technology**

**Department: Mechanical & Energy Technologies**

**Semester/Year: Fall 2018**

A. **TITLE:** Engine and Power Transmission Service

B. **COURSE NUMBER:** MSPT 110

C. **CREDIT HOURS:** 4 credit hour(s) per week for 15 weeks

- One hour (50 minutes) of lecture per week Twice
- Two to three hours of lab or clinical per week This is a four hour two credit lab.
- Two hours of recitation per week
- 40 hours of internship

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 involves the complete disassembly, inspection, repair and reassembly of modern modular constructed powertrain assemblies. The principles of operations key to high performance, compact engines/transmission assemblies are thoroughly covered.

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

MSPT 101-Powersports Service, or with permission of instructor

**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:

<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>	
a. Perform precision measurements key to engine overhaul	MSPT SO 2 MSPT SO 4		ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
b. Identify various engine design configurations	MSPT SO 2		ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
c. Diagnose and repair modular constructed powertrain assembly problems	MSPT SO 2		ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
d. Calculate gear ratios related to modular powertrain assemblies	MSPT SO 4		ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
f. Practice fundamentals associated with engine blueprinting			ISLO ISLO ISLO	Subsets Subsets Subsets 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:**

Modern Motorcycle Technology, Third Edition by Edward Abdo, Cengage Learning

Automotive Engines Theory and Servicing, Ninth Edition, by James D. Halderman, Pearson

L. **REFERENCES:**

Manufacturer specific service manuals

M. **EQUIPMENT:** None  Needed: Standard powersports laboratory equipment

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

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

Quizzes, exams, homework, laboratory reports, and laboratory participation

P. **DETAILED COURSE OUTLINE:**

I. **Introduction**

1. **Class procedures and policies**
2. **Opening discussion**

II. **Engines**

1. **Four stroke engines**
2. **Cam shaft arrangement**

III. **Valve train assemblies**

1. **Pneumatic opening**
2. **Desmodromic**
3. **Coil springs**

IV. **Engine case design**

1. **Unit construction**
2. **Non-unit construction**
3. **Vertical/horizontal split crank cases**

4. **One-piece case (trap door case)**

V. **Pistons, crankshafts and cylinders**

1. **Single cylinder engines**

2. **Multi-cylinder engines**

3. **Cylinder design and construction**

4. **Cylinder head design**

5. **Piston construction**

6. **Piston ring grooves**

7. **Four cycle engine bearings**

VI. **Two stroke engine designs**

1. **Intake timing**

2. **Piston port**

3. **Reed valve**

4. **Rotary valve**

5. **Piston port/crank case reed**

VII. **Transfer and exhaust timing**

1. **Exhaust system design**

2. **Scavenging process**

VIII. **Crank case sealing**

1. **Timing side**

2. **Wet side**

3. **Pressure test**

4. **Vacuum test**

IX. **Crank shaft configurations**

1. **Single cylinder crankshafts**

2. **Twin cylinder crankshafts**

3. **Multi cylinder crankshafts**

X. **Power transmissions**

1. **Gear action**

2. **Primary drives**

3. **Clutching**

4. **Transmission/final drives**

5. **Internal gear changing mechanisms**

6. **Final drive systems**

7. **Calculating ratios**

Q. **LABORATORY OUTLINE:** None  Yes

I. **Introduction**

A. **Laboratory procedures and policies**

B. **Basic laboratory introduction**

II. **Four Stroke Engines**

A. **Disassembly and inspection**

B. **Measurement**

**C. Comparison to spec.**

**D. Reassembly**

**III. Valve Train Assembly Maintenance**

**IV. Two Stroke Engines**

**A. Disassembly and inspection**

**B. Measurement**

**C. Comparison to spec.**

**D. Reassembly**

**V. Cylinder Reconditioning**

**A. Cylinder boring**

**B. Honing**

**VI. Crankshaft Rebuilding**

**A. Single cylinders/multi-cylinders**