

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
MSPT 130 - Marine Propulsion Systems**

Created by: Christopher Mayville

Updated by:

Canino School of Engineering Technology !

Department: Mechanical & Energy Technologies !

Semester/Year: Fall 2018 !

A. **TITLE:** Marine Propulsion Systems

B. **COURSE NUMBER:** MSPT 130

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 2

Lecture Hours: 1 per week

Lab Hours: 2 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:**

A study of the different types of propulsion systems relative to various types of aquatic craft, including jet and propeller will be studied. The theory and construction of propulsion systems will be discussed.

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

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> | |
|--|--|--------------------------------------|---------------------------|--|
| a. Perform routine maintenance procedures associated with marine propulsion drives | MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| b. Diagnose and repair marine propulsion performance problems | MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| c. Disassemble, inspect and reassemble marine propulsion systems | MSPT SO 4 | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
| d. Identify different propulsion systems specific to pleasure craft | | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |
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| 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:**

None, Instructor organized content and worksheets

L. **REFERENCES:**

Yamaha Dealer Website, Yamaha Motor Training Website, Mercury Marine Manuals

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

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

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

Quizzes, homework, exams, laboratory activities, and laboratory participation

P. **DETAILED COURSE OUTLINE:**

I. **Introduction**

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

II. **General use and maintenance of outboard motors**

- 1 **Installation**
- 2 **Steering systems**
- 3 **Operational checks**

III. **Storage of marine engines and drives**

- 1 **Storage of engines with pre-mix**
- 2 **Storage of engines with oil injection**
- 3 **Storage of drive systems**

IV. **Drive types**

- 1 **Outboard**
- 2 **Inboard**
- 3 **I/O**
- 4 **Screws**

- 5 **Jet drives**

- V. **Mid-section and lower unit**
 - 1 **Exhaust housing construction**
 - 2 **Adaptors**

- VI. **Operating principles of the lower unit**
 - 1 **Lower unit housing design**
 - 2 **The shift system**
 - 3 **Repairing and maintaining the lower unit**

- VII. **Trim and tilt systems**
 - 1 **Power trim (Mercury)**
 - 2 **Integral power trim and tilt (OMC)**
 - 3 **Trim/tilt electrical systems (OMC)**

- VIII. **Propeller performance**
 - 1 **Propeller thrust**
 - 2 **What the propeller does**

- IX. **How propellers work**
 - 1 **Pitch and slip**
 - 2 **Blade rake**
 - 3 **Trim angle adjustment**

- X. **Propeller performance problems**
 - 1 **Cavitation**
 - 2 **Ventilation**
 - 3 **Cupping or propeller blades**
 - 4 **Damaged propellers**

- XI. **Propeller directional rotation**
 - 1 **Right hand screw**
 - 2 **Left hand screw**

- XII. **Boat performance problems**
 - 1 **Trim angle**
 - 2 **Weight distribution**
 - 3 **Marine fouling**
 - 4 **Powering the boat**

- Q. **LABORATORY OUTLINE:** None Yes

- I. **Introduction**
 - 1 **Laboratory procedures and policies**
 - 2 **Basic laboratory introduction**

- II. **Introduction to outboard motors**
 - 1 **Installation**
 - 2 **Steering systems**
 - 3 **Operational checks**

III. Storage of Marine Engines and Drives

1 Storage of engines

2 Storage of drives

IV. Drive Types

1 Basic service and maintenance

2 Operating principles

V. Trim and Tilt Systems

1 Integral trim systems

2 Remote trim systems

VI. Propellers

1 Types

2 Maintenance

3 Theory