Yamaha Marine Maintenance Certification Program
Introduction to Outboard Systems
Total: 80 hours / 2 weeks

Chapman SCHOOL OF SEAMANSHIP

CAREER

EDUCATIONAL OBJECTIVES

- To facilitate mastery of maintenance tasks associated with various Yamaha outboard engines, as per the service interval requirements in the applicable service manual for 20 to 1000 hours of engine operation.
- Students who successfully complete the course will receive the Introduction to Outboard Systems Certification "IOS" which is a pre-requisite for the Yamaha Maintenance Certification Program (MCP), based on the 20, 100, 300, 500 and 1,000-hour maintenance procedures for Yamaha Outboards.
- This is a continuing education program designed for students wishing to expand their knowledge and expertise in Yamaha Outboard Engines.

COURSE DESCRIPTION

Introduction to Outboard Systems

Boating Basics - 4 hrs.

Study of the modern boating industry, careers, marine motor designs, major components; steering systems & gauges. Basic nautical terminology for vessels, trailers and different hull types.

Materials, Parts & Tools - 4 hrs.

Standardized measuring units, common materials; fasteners and common parts assembly, gears and seals. Tools used including wrenches and measurement tools. Measuring clearances and forces, as well as testing leads.

Electrical - 8 hrs.

Basic Electrical: Including types of electricity, voltage, current and resistance. Conventional current vs electron flow, Ohm's Law, creating voltage, voltage drop and batteries.
Electrical Circuits: Closed circuit, open circuit, series and parallel circuits. Analyzing circuit problems, electrical symbols and diagrams.
Outboard Electrical Systems: Battery and battery free outboards; starting and charging systems, including checking a starting system and checking a charging system.

Outboard Ignition Systems - 8 hrs.

Compression, Fuel and Ignition,:
The importance of reliable ignition, electricity basics, self-induction and manual induction.
Components: Spark plug and maintenance. Ignition coil; ignition coil secondary circuits. Pulser coil, ignition timing, firing order of outboards and timing adjustment.
Types of Ignition Systems:
Power source, ignition system control and related ignition system terminology.

Fuel Systems - 8 hrs.

- Fuels, gasoline and gasoline properties. Analyzing fuel problems.
- Fuel system components; Air-fuel mixture; Venturi.
- Carburetor principles and systems; Changing the Air-Fuel ratio.
- Electronic fuel injection (EFI) Advantages, EFI system, EFI Classifications, number of injectors, components of EFI systems. EFI modes and methods.

Fuel Systems - (cont)

- High Pressure Direct Injection (HPDI) Why HPDI, key words terminology

Powerheads - 8 hrs.

Powerheads Basics:
Torque and horsepower; Internal Combustion Engines, motor displacement; comparing motor types.

Two Stroke Motors:
Basic operation of two stroke motors and port timing.

Four Stroke Motors:
Basic operation of four stroke motors; valve timing; engine balancing; four stroke valve trim; camshafts and timing; valves; valve arrangement and servicing.
Cooling system; intake and exhaust manifolds; exhaust gases & emissions; Nitrogen Oxide emissions; recirculation of crankcase gases.

Crankshaft and Pistons:

Crankshafts; flywheels; engine bearings and their selection; installing bearings; pistons; piston rings and ring gap; cylinder bore measurement: powerhead terminology.

Lubrication - 8 hrs.

- Friction and Lubricants; oil designations; grease designations.
- Two stroke motor lubrication: Premixing the oil; two stroke oil injection.
- Four stroke motor lubrication: Splash type; wet sump lubrication; dry sump lubrication.
- Why is service needed? Why parts wear prematurely; four-stroke oil service; other areas of outboard lubrication; lubrication terminology.

Introduction to Outboard Systems Schedule 2025/2026

Class #	**08-25**	**10-25**	**01-26**	**03-26**	**08-26**	**10-26**
Starts	08/04	10/20	01/12	03/30	08/03	10/12
Ends	08/15	10/31	01/23	04/10	08/14	10/23
Holidays						

Drive Unit - 8 hrs.

Drive Unit: Components of the upper case; cooling system water flow; water pump service; path of exhaust gas; exhaust noise reduction.

Lower Unit: Lower unit operation, components, lubrication, gear systems, and types of shift mechanisms.

Gear Assembly and Adjustment: Gear assembly and adjustment; bevel gears; lower unit adjustment; mounting the propeller; drive unit terminology.

Propellers - 8 hrs.

- What is a propeller?
  Marine propulsion; requirements of a propeller; propeller materials; propeller hub exhaust system.
- Number of propeller blades; basic propeller design; parts of the propeller blade; cavitation: ventilation
- Propeller hubs; shear pin hub; pressed in rubber hubs; Shift Dampener System (SDS).
- Propeller matching, testing, and maintenance ; annual inspection; propeller failures and causes.

Brackets - 4 hrs.

Outboard Mounting Brackets:
Bracket components, attaching the outboard to the boat, motor mounts, transom information.

Steering: Steering and digital steering.

Trim and Tilt : Power tilt, power trim and tilt (PT & T); reverse operation.

Shock Absorber: After impact, mechanical.

Valves: Manual, relief, main, absorber, servicing a PT & T Unit.

Corrosion - 8 hrs.

Types of Corrosion: What is corrosion? Corrosion around us; main causes of corrosion; chemical corrosion; potential difference between metals; environmental influences; what it is made of matters.

How to control corrosion: Painting; plating; sacrificial anode method; corrosion resistant materials.

Protection of boat and outboard motors: Managing boat corrosion; managing outboard motor corrosion; corrosion terminology

Rigging - 4 hrs.

- What is Rigging?;
- Mounting an outboard motor**:** Transom mounted motor brackets; Water level guidelines; Boats with multiple outboard motors; Horsepower limitations; Estimating maximum boat speed.

.Rigging - (cont.)

- Rigging connections: Mechanical remote controls; instruments; steering; fuel line routing and filters; boats and modern day electrical requirements; data networks.

ADMISSION

To qualify for admission, the student must be 17 years of age or older, in overall good health, and must be able to use mathematical skills and the English language in order to fully benefit from the program.

The Registration Form must be completed, signed and returned to the School along with the $500.00 (Non Refundable) Tuition Deposit.

Balance of Tuition is due 30 days prior to the start of class.

Students must have an official photo ID on the first day of class.

Once classes start, students may not change or downgrade to another program.

TUITION & FEES

Tuition Deposit …..	$ 500.00
Tuition Balance …..	$1,500.00
Total Tuition ……..	$2,000.00

- The Chapman School Registration Form must be completed and signed (by a parent or guardian if the applicant is younger than 18) and returned to the Chapman School along with the $500.00 non-refundable Tuition Deposit.
- Tuition Balance is due in full 30 days prior to the first day of class.
- Tuition includes books but does not include housing, board or transportation.
- All costs payable in U.S. currency only.
- Visa, MasterCard, Discover and American Express are accepted.

REFUND POLICY

- If the application is not accepted by the School, all payments made will be promptly refunded.
- If cancellation is requested within three (3) business days after signing the Registration Form, all payments made by the applicant will be refunded in accordance with the Buyer's Right to Cancel.

REFUND POLICY…(Cont.)

- If the School cancels the program due to insufficient enrollment, I may be rescheduled to a future class, or all payments made will be refunded. In the event that I am unable to attend the class for which I am registered the following change/refund policy will apply:

1. If cancellation is requested more than three (3) business days after signing the Registration Form, but before the beginning of class instruction, the applicant is obligated for the $500.00 Tuition Deposit.
2. Where notice is provided to the School more than fourteen (14)days before the start of class, a student may transfer to another class upon payment of a $50.00 transfer fee.
3. If notice is provide to the School less than fourteen(14)days before the start of class to cancel, or if I do not arrive for the scheduled class, or wish to withdraw from class, I may be obligated for the full amount of the tuition.

- If a credit card was used as the original method of payment, a convenience fee of 3.0% of the total amount refunded will apply for all transactions.
- Refunds are made within thirty (30) days after the date the student fails to enter or terminates training.

Curriculum, fees, expenses and other matters described herein are subject to change without notice at the discretion of the Chapman School of Seamanship. Currently enrolled students who have paid in full will not be affected by any such changes unless they change the date of enrollment to a future class.

OTHER REQUIREMENTS

Students are required to have the following available for class:

- **Laptop or tablet computer**
- **Protective work shoes or boots**
- **Protective Eyewear**

STUDENT HOUSING

Campus housing consists of dormitory apartments. Each apartment contains a bedroom, convertible living room/bedroom, bath, kitchenette and covered porch. All apartments are air conditioned, fully furnished and equipped with refrigerator, counter top range and cooking utensils. Housing fee includes utilities. The maximum number of students per unit is usually two.

Campus housing must be booked in advance to assure availability.
Sorry, no pets.

The School is not responsible for the loss of any personal property.

Housing Fee Shared Rate
(14 nights). ……..… $700.00

Student Housing fees are due 30 days prior to the start of class.

HOUSING REFUND

- If a student cannot attend the class in which registered, housing fees are refundable.
- Once a student moves into the facilities, no fees will be refunded.
- If a credit card was used as the original method of payment, a convenience fee of 3.0% of the total amount refunded will apply for all transactions.
- In the event any student does damage to the accommodations, he or she will be responsible for the replacement cost & labor required to repair the damaged School property

Chapman School does not discriminate on the basis of age, sex, religion, race or ethnic group in the administration of its policies and programs.

ATTENDANCE

Attendance Requirements

90% attendance is required. This requirements is strictly enforced whether the absence is excused or unexcused.

Class Schedule

Monday through Friday from 8:00 am to 5:00 pm each week of training.

Absences

More than 10 hours is considered excessive and may cause dismissal from the School. Veterans benefits are interrupted at this point.

Excused Absences

A request for the absence should be submitted in writing by the student and approved by a member of the administrative staff prior to the absence, except in case of illness or other emergency. If the excused absence is during a testing period, the student must notify instructors promptly and arrangements made to take a makeup test.

Tardiness

Lateness for any part of an hour will be counted as a full hour of absence.

Leaves

A student who takes extensive leave beyond the allowed attendance policy limits due to special circumstances such as prolonged illness, family emergency, called to active duty etc., will be permitted to re-enter at the phase of training that is identical to the one he or she left.

Earlier phases of training may be repeated at no additional tuition cost as determined by the School.

Veteran students must be terminated for pay purposes.

GRADING POLICY

Tests & Examinations

Quizzes and examinations will be scheduled during the course. Students must achieve a minimum of 80% in quizzes to qualify for the final examination.

These grades may be reviewed by the student upon request.

Final Grade

The final program grade for the 80 hour program will be based on the average of all quizzes and the final examination.

To qualify for graduation, the final average must be a minimum of 80%.

Student Progress

All student records will be kept on file for viewing by the student and authorized parties.

A standard system of weighted percentages is used for recording student progress. To remain in good standing, a student must maintain an average of 80% or better.

If a student's average falls below 80%, he or she may be permitted to continue in school for an additional time period established at the time of a progress report. During this time, the student is required to pass coursework with grades that will bring his/her average up to satisfactory. This period is considered probationary. If grades are not brought up to passing, the student will be terminated for unsatisfactory progress. At this point, veterans benefits may be interrupted. Re-entry will be at the discretion of the School's administration.

GRADUATION

Requirements for Graduation

Yamaha Marine University will award a national certification to the successful graduates. Graduates must achieve a final average grade over all quizzes and exams of 80% or better. All attendance requirements must be met and any financial obligations to the School must also be satisfied.

.**Notes:**

Chapman
SCHOOL OF SEAMANSHIP

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