

MARA A154: VESSEL AND ENGINE MAINTENANCE

Item	Value
Curriculum Committee Approval Date	10/04/2023
Top Code	095900 - Marine Technology
Units	2 Total Units
Hours	72 Total Hours (Lecture Hours 18; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

This course offers hands on experience in vessel; cleaning interior & exterior surfaces. Students will learn the practical operation and routine maintenance of mechanical systems aboard vessels, diesel inboard engines and gasoline outboard engines. Skills practiced include painting, varnishing and routine engine maintenance. This is a required course of the Professional Mariner Program. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Create a maintenance schedule and demonstrate ability to maintain exterior surfaces and interior spaces of vessel.
2. Respond to bilge pump alarm or inadequacy of bilge pump operation.
3. Perform routine checks on diesel engine and routine maintenance on outboard engines.

Course Objectives

- 1. Appraise cleaning or maintenance required.
- 2. Describe overview of vessel systems.
- 3. Identify if bilge pumps are working adequately.
- 4. Summarize describe environmental regulations.
- 5. Identify components of a diesel engine.
- 6. Identify components of an outboard engine.

Lecture Content

Maintenance: Cleaning exterior surfaces: fiberglass, natural teak varnished wood surfaces Interior cleaning maintenance Maintain exterior surfaces: chrome, paint, varnish Covers Exterior maintenance: epoxy, caulking Solvents, cleaning agents Environmental considerations regulations Vessel systems – introductory overview: Fuel water tanks, gauges: read fluid, temperature pressure gauges Electrical system: batteries, cables, charging Power Management Exhaust system, gauges shaft logs Bilge pumps, intake maintenance, emergency, manual Waste systems: Regulations procedures for emptying holding tanks, environmental regulations Generators, shore power: identify plugs hookups Water pumps, water heaters, through hull fittings valves, refrigeration Diesel engines: Engine component identification Routine checks maintenance Cooling systems Fuel system Engine alarm systems

Engine troubleshooting Outboard engines: Fuel mixtures Safe fueling methods Care routine maintenance Troubleshooting

Lab Content

Lab work: Hands-on work checking fluids, belts, and exhaust systems on diesel engines. Sanding, painting, and varnish work Splicing of lines Assisting with outboard motor maintenance such as flushing cooling systems and changing gear oil.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture Demonstration Practical skills Reading assignments Practical application with student participation

Reading Assignments

Reading assignments Topical research Homework including research for project plan Approximately 1 hour a week

Writing Assignments

Creation of a project plan. Written report of the individual class project. Approximately 3 hours a week

Out-of-class Assignments

Day work and semester class project. Creation of Powerpoint presentation. Approximately .5 hours a week

Demonstration of Critical Thinking

Exams Practical Assessments of skills in labs which includes problem solving to create splices and assess basic engine needs to run. Semester Project which demonstrates project management, problem solving skills Oral presentation

Required Writing, Problem Solving, Skills Demonstration

Demonstration of skills: prepping cleaning vessels Splicing Sanding Problem Solving Skills: Basic engine troubleshooting Writing Skills: Project plan report

Eligible Disciplines

Marine engine technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Chapman, Charles Fredrick. Chapman Piloting and Seamanship, 69 ed. New York City: Hearst books, 2022

Other Resources

1. Selected handout materials to be provided and distributed by the instructor.