SMALL VESSEL FABRICATION AND REPAIR (MARR)

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Website: *programs.honolulu.hawaii.edu/metc or www.honolulu.hawaii.edu/marr*

Address: Marine Education and Training Center, 10 Sand Island Parkway, Honolulu, HI 96819.

Faculty: Mark Keala Kimura, Robert (Bob) Perkins (Director)

Program Mission: The Small Vessel Fabrication & Repair program's mission is to serve the community as a learning-centered, open door program providing technical training to meet the demands of companies within the small vessel fabrication and repair industry as well as the needs of the individual. An open-exit option allows students to identify their career objectives and participate in program exploration.

Program Description:
The Small Vessel Fabrication & Repair program is a two-year Associate in Applied Science program whose main goal is to prepare individuals for employment in the boat maintenance, repair, and manufacturing industries. Students work on a variety of "real world" repair, service and construction projects. Hands-on instruction is provided in composite boat construction and repair, marine woodworking and joinery, lofting, plug and mold construction and marine spray painting systems. Boat yard operation skills are practiced year round including marine straddle-lift operation, crane operation, forklift and hydraulic trailer operation. There are also courses that focus on the rigging, mechanical, plumbing, propulsion, and electrical systems of boats.

The Small Vessel Fabrication and Repair program has just been granted inclusion as one of American Boat and Yacht Council's (ABYC) Marine League Schools, one of less than ten schools in the United States. This very prestigious designation will allow the program to grant ABYC certificates to students who fulfill the requirements of the courses.

The majority of instruction for the program is held at the Marine Education and Training Center (METC) located on Sand Island, Keehi Lagoon, which is a state-of-the-art training facility. The METC ranks as one of the premier training facilities in the United States featuring four large work bays to allow work on vessels up to 45 feet, a concrete pier equipped with two cranes to allow work on vessels in the water, finger piers for removing vessels from the water employing a marine straddle-lift, as well as classroom, laboratory, and office space.

For enrollment in the program, students must be able to climb a twelve-foot ladder onto a vessel's deck, get on the deck, walk around the cabin and descend to the ground in a time period of not more than twice the time it takes the instructor to perform these tasks. The students must be able to jump onto the deck of a boat that is 18 inches below pier level, work in a crouching or standing position for hours at a time, lift 40 pounds from the floor onto a 34 inch high table top, and be physically fit to wear an organic respirator. Each student will be required to obtain a note from a physician stating that the student is capable of wearing an organic respirator. There are many physical demands and hazards in the boat maintenance and repair industry and the program. These include, but are not limited to, occasional heavy lifting, bending, crouching, and working in a cramped position. There will be exposure to woodworking saw blades and cutters, rapidly moving parts, and live electrical circuits. There will also be exposure to resins, solvents, fuel, paints, exhaust fumes, and dust. Students may get cuts, abrasions, burns, aches, and pains.

Program Student Learning Outcomes (SLO): Upon successful completion of the Small Vessel Fabrication and Repair program, students will be able to:

- Perform tasks in accordance with American Boat and Yacht Council (ABYC) Standards and best practices.
- Secure vessels, safely operate machinery and perform operations associated with dry-docking operations.
- Operate and maintain standard woodshop stationary and portable tools; sharpen, tune, and use standard woodworking hand tools; true wood stock accurately, safely, and efficiently; construct shop fixtures and jigs; and, read, interpret and create blueprints.
- Identify a variety of composite materials, formulate laminate schedules and demonstrate proficiency

in laminating techniques, perform standard composite quality control tests, practice quality assurance and safety, and utilize the practical principals of composite-resin chemistry.

- Present a systematic approach to surveying damaged composite vessels and be able to execute marine-quality composite repairs.
- Perform pre-paint preparation and procedures, understand air compressor requirements, utilize common coating application systems, techniques and equipment, and understand and employ multi-component paint systems.
- Fabricate components necessary to build a boat hull from a lofting, practice principals of attaining quality molds, apply spray and manual mold release systems, and calibrate and operate a plural component "chopper gun".
- State the basic operational principals and maintenance of common marine propulsion systems, and perform basic service and troubleshooting of marine engines.
- Perform trouble-shooting and testing of marine circuits, perform installation of electrical components commonly found on a vessel, perform marine battery service, recharging and installation, and understand and employ corrosion control systems.
- Understand State and Federal wastewater discharge regulations and perform installation and maintenance of plumbing components commonly found on a vessel.
- Survey a sailboat's rig including running and standing rigging and perform installation and maintenance of systems commonly found on sailboats rigs.

Program Requirements:

Recommended Prep: *IS 20* **Note: Respirator Use Clearance Also Required**		**Certificate of Achievement Credits**	**Associate in Applied Science Degree Credits**
First Semester			
MARR 120	*Introduction to Marine Technology*	*1*	*1*
MARR 122	*Portable Hand Tools and Machinery*	*2*	*2*
MARR 124	*Introduction to Composite Technology **	*3*	*3*
MARR 129	*Blueprint Reading for Marine Technicians*	*2*	*2*
MARR 130	*Woodworking*	*3*	*3*
MARR 142	*Introduction to Marine Propulsion*	*2*	*2*
MATH 150	*Technical College Mathematics*		*3*
		13	*16*
Second Semester			
MARR 133	*Marine Finish Systems*	*4*	*4*
MARR 152	*Introduction to Marine Electrical Systems **	*3*	*3*
MARR 153	*Introduction to Marine Plumbing Systems**	*3*	*3*
MARR 154	*Sailboat Rigging*	*2*	*2*
*General Education Requirement – Humanities and Fine Arts ***			*3*
		12	*15*
Third Semester			
MARR 221	*Boat Hauling Procedures*		*4*
MARR 225	*Composite Repair Techniques*		*3*
MARR 231	*Yacht Joinery*		*3*
ENG 100	*Composition I* *Advanced Technical Writing*		*3*
HWST 281	*Ho'okele I: Hawaiian Astronomy and Weather*		*3*
HWST 281L	*Ho'okele I: Hawaiian Astronomy and Weather Lab*		*1*
			17
Fourth Semester			
MARR 240	*Marine Blueprint Reading and Lofting*		*3*
MARR 241	*Mold Station Construction*		*2*

MARR 243	*Composite Tooling*		*4*
MARR 250	*Mold Fabrication*		*3*
MARR 251	*Composite Production*		*3*
PSY 180	*Psychology of Work*		*3*
			18
	Minimum Credits Required	*25*	*66*

* Courses having ABYC curriculum (MARR 124, 152, 153) will allow students to sit for the particular ABYC certificate associated with that course.

** General Education requirements for the AAS Degree are listed under *DEGREES & CERTIFICATES.*

Cost of Textbooks/Supplies: The total cost of tools, textbooks, and supplies for the two-year program is approximately $2,200. Mandatory student membership in the American Boat and Yacht Council (ABYC) - Marine League of Schools, is $69.95 annually.

Advisory Committee:
Susan Boatman, Manager, Port Supply
Robin Bond, Hawai'i Ocean Safety Team
John Coon, Designer, Tradewinds Marine Services
Jim Maynard, Owner, Pacific Diversified Finishes
George Norcross, President, Epoxy Sales Hawai'i, Inc.
Chris Rauch, Manager, Applied Engineering Navatec
Dennis Smith, President, Marine Surveyors and Consultants
Larry Stenek, Owner, Art Nelson Sailmakers, Inc.