

**Honolulu Community College
Marine Education and Training Center
Boat Maintenance and Repair Program**

Course Syllabus

Course Name: Composite Repair Techniques

Course Number: MARR 25

Course Credits and Hours: 3 credits; 90 hours lecture/lab

Prerequisites: MARR 24

Course Description: Covers the procedures employed in surveying, planning and executing repairs to composite vessels. In addition, various common procedures used in the industry for composite repairs are covered in lecture, and projects dealing with these procedures are provided in the lab.

Course Objectives:

Upon successful completion of this course, the student will be able to:

1. Present a systematic approach to surveying a boat's hull and deck damage or poor construction, stressing the use of the senses (sight, touch, smell and sound) as diagnostic tools
2. Demonstrate the use of the moisture meter as a surveying tool in order to discover excess moisture in a composite laminate
3. Execute cosmetic gel coat repairs
4. Execute solid fiberglass repair
5. Execute structural reinforcing
6. Execute minor blister repairs

Course Outline:

I. SURVEYING

- A. Visual Inspection
 1. Stress Cracks
 2. De-lamination of bulkheads, decks
 3. "Oil canning"
- B. Tactile Inspection
 1. Fairness of hull
 2. Lumps/cracking in laminate
- C. Smell
 1. Catalyst odor
 2. "vinegary" odor

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D. Sound

1. Tapping

II. USE OF MOISTURE METER

- A. How it operates
- B. Contrasting readings from topsides to bottom-sides
- C. Recording readings

III. GEL COAT REPAIRS

- A. Wax Additives
- B. Spraying with Duratec
- C. Color matching
- D. Wet sanding
- E. Buffing

IV. SOLID FIBERGLASS REPAIR

- A. Surface Preparation
- B. Laminate design
- C. Planning of repair
- D. Mold repair

V. STRUCTURAL REINFORCING

- A. Top Hat
- B. Panel stiffening
- C. Utilization of higher-stiffness materials

VI. BLISTER REPAIR

- A. Causes
- B. Surface Preparation
- C. Drying Techniques
- D. Prevention

Evaluation:

Standard Alpha System:

- | | |
|---|----------|
| A | 94-100 |
| B | 88- 93 |
| C | 80- 87 |
| D | 70- 80 |
| F | below 70 |

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Evaluation by percentages:

40% - Hands on projects and exercises; graded for accuracy, neatness and attention to detail.

40% - Written tests; given to determine understanding of principals

20% - METC's Work Habits Evaluation (previously issued)

The evaluation addresses behavior such as "Does the student report to class on time and prepared? Does the student use lab time wisely? Does the student cooperate with the instructor and team members? Is METC policy followed? Does the student participate in class discussions?"

Many handouts will be issued to you throughout your career at the METC. It is imperative that you keep a three ring binder with labeled dividers. During some written tests you will be allowed to refer to your notes. You will also find it beneficial to refer to your notebook while executing projects. Your notebook will directly effect your written and "hands on" project scores. Your notebooks will periodically be turned in and evaluated.

Prompt attendance is vital to your success. Many "hands-on" projects and demonstrations simply can not be repeated. The table below demonstrates how absences and tardiness will limit how high a grade you will be eligible to receive for this course.

If you miss:	You are eligible for a(n)
5 hours or less	A
10 hours or less	B
15 hours or less	C
20 hours or less	D
More than 20 hours	F

Each Tardy will equal 1/2 Hour absent. This includes being late returning to class from break.

Please call to inform if you are going to be absent. Many of our projects are tackled as a team. We need to know if a team member is going to be absent. The answering machine is on phone # **832-3682**.

If you do not call to notify of your absence and there is a test, and you are granted permission to take a make-up test, a 14 point (based on 100 pt. scale) penalty can be deducted from your make-up score. Be advised that any make-up exam administered may be different in format from the original exam, and may include oral examination.

Textbooks:

Polycor, *Polyester Products Application Manual*, 9th edition,

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(Cook Composites and Polymers, PO Box 419389 Kansas City, MO. 641141-6389)

The Fiberglass Boat Repair Manual, Allan Vaitses, International Marine/McGraw-Hill