

**Honolulu Community College
Marine Education and Training Center
Vessel Fabrication and Repair**

Course Syllabus

Course Name: Composite Production

Course Number: MARR 51

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

Prerequisites: MARR 50

Course Description: This course uses a production mold to produce a boat hull. Hand laminating techniques are taught as well as chopper gun use & review from MARR 50. Vacuum bagging techniques are taught in conjunction with coring. Demolding techniques are shown and practiced. Calculating type and amount of materials needed is shown.

Course Objectives:

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

1. Practice gel coat application
2. Practice hand laminating techniques
3. Become more adept in the use of the chopper gun
4. Practice vacuum bag molding techniques for core installation
5. Practice demolding techniques
6. Understand how to calculate the amount and type of materials to be used

Course Outline:

- I. GEL COAT APPLICATION REVIEW**
- II. HAND LAMINATING TECHNIQUES IN PRODUCTION APPLICATIONS**
- III. CHOPPER GUN TECHNIQUES**
 - A. Set Up
 - B. Calibration Of Catalyst And Glass To Resin Ratios
 - C. Spray Techniques
 - D. Maintenance And Trouble Shooting

IV. VACUUM BAG MOLDING

A. Principles Of Using Vacuum To Install Core Materials

1. atmospheric pressure
2. pressure differential

B. Materials

1. peel ply
2. breather
3. bag
4. sealants

C. Vacuum System

1. vacuum pump
2. manifold
3. plumbing options
4. gauges

D. Putties (core-bond, for example)designed for bonding core to outer skin.

1. core bond test
2. trowelling methods

V. DEMOLDING TECHNIQUES

A. Compressed Air

B. Polypropylene Wedges

VI. MATERIALS CALCULATION

A. Thickness calculation

B. Considerations for cosmetics

C. Strength versus stiffness

Evaluation:

Standard Alpha System:

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

Evaluation by percentages:

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

40%- Written tests are given to determine understanding of principals.

20%- METC Work Habits and Rating Scale*

Marine Education & Training Center
MARR 51
Course Syllabus

*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 to returning to class after a designated 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.

Required Textbooks:

Polyester Products Application Manual, Cook Composites & Polymers, Kansas City, Missouri