

Course Syllabus

Course Name: Marine Electrical Systems

Course Number: MARR 52

Course Credits and Hours: 2 credits; 60 hours lecture/lab

Prerequisites: PHYS 56

Course Description: This course provides an overview of the various marine electrical systems found on modern marine vessels. Installation and wiring of various lights, instruments, etc. is also included.

Course Objectives:

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

1. Review basic dc and ac theory
2. Review electrical safety rules and regulations
3. Practice checking polarity of ac shore power
4. Practice use and maintenance of marine electrical tools and instruments
5. Practice practical application of trouble-shooting theory
6. Practice installation of components in a ship's dc system (including coaxial connections, vhf radio, transducer and knot meter)
7. Practice marine battery installation
8. Practice marine battery charger inspection
9. State advantages of an inverter and diagram installation
10. Practice trouble shooting marine alternators
11. Practice trouble shooting basic gen-set systems
12. Review corrosion as it relates to metals in the marine environment

Course Outline:

I. REVIEW OF BASIC DC AND AC THEORY

- A. Ohms Law
- B. DC Theory
- C. Wire Gauge

Marine Education & Training Center
MARR 52
Course Syllabus

II. REVIEW ELCTRICAL SAFETY RULES AND REGULATIONS

- A. Worker Safety
- B. ABYC Regulations
- C. Coast Guard Regulations

III. SHORE POWER

- A. Polarity
- B. Interfacing With On-Board Generators

IV. ELECTRICAL TOOLS AND EQUIPMENT

- A. Volt Meter
- B. Hydrometer
- C. Load Tester
- D. Wire Strippers
- E. Connectors

V. ELECTRICAL TROUBLESHOOTING

- A. Isolating Shorts
- B. Repair

VI. COMPONENT INSTALLATION IN A DC SYSTEM

- A. Coax
- B. VHF Radio
- C. Transducer(s)
- D. Instruments
 - 1. Navigation
 - 2. Engine

VII. BATTERY INSTALLATION

- A. Battery Box
- B. Location
- C. Battery Maintenance

VIII. CHARGING SYSTEM

- A. Battery Charger
- B. Safety Procedures

IX. INVERTORS

- A. Application
- B. Installation

X. ALTERNATORS

- A. Calculating Size
- B. Maintenance
- C. Troubleshooting

Marine Education & Training Center
MARR 52
Course Syllabus

XI. CORROSION

- A. Galvanic (Electrolysis)
 - 1. Galvanic Series
 - 2. Crevice Corrosion
 - 3. Pitting
 - 4. Stress
 - 5. Dezincification
- B. Bonding
- C. Zincs

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 exercises; graded for accuracy, neatness and attention to detail.

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

20% - METC's Work Habits Evaluation*

*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.

Marine Education & Training Center
MARR 52
Course Syllabus

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)
3 hours or less	A
6 hours or less	B
9 hours or less	C
12 hours or less	D
More than 12 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.

Textbooks:

Boatowner's Mechanical and Electrical Manual, Nigel Calder, International Marine, McGraw/Hill

Boatowner's Illustrated Handbook of Wiring, Charles Wing,

Tools Required:

Multimeter and wire crimps