

“Basic Marine Electrical” Course Outline

This is a three day basic DC & AC marine electrical systems program. Text for the class will be “Boating Magazine’s Powerboater’s Guide to Electrical Systems” by Ed Sherman, the instructor.

DAY 1 – 8:30AM

- ✓ Direct Current Circuits
 - A Circuit
 - Ohm’s Law/How to use it
 - Load’s in Series/Parallel
 - Sources in Series/Parallel
 - Circuit Problems & Causes

- ✓ Direct Current Measurements
 - Digital Instruments
 - Troubleshooting with Testers

- ✓ Batteries
 - The Charge/Discharge Cycle
 - Battery Types & Design Features
 - Monitoring Batteries
 - Testing Batteries

- ✓ Batteries continued
 - Discharge/Charging Characteristics
 - Charging Recommendations
 - Sizing Storage Batteries
 - ABYC Standard E-10

DAY 2 – 8:00AM

- ✓ Alternators
 - Rotary-Current Machine
 - Diodes & Rectification
 - Controlling the Alternator
 - Type-P and Type-N Alternator
 - Powering the Regulator
 - Testing Charging Systems
 - ABYC Standards A-20

- ✓ Bonding
 - What is it?
 - Electrical System Grounding
 - Lightning Protection
 - Corrosion Protection
 - Stray-Current Corrosion
 - To Bond or Not to Bond
 - Testing Your Protection

- Cathodic Protection
- ABYC Standards E-2 and E-4

- ✓ DC Standards
 - Wiring Diagrams
 - Marine Wire
 - ABYC Load-Calculation Method
 - Allowable Amperage of Conductors
 - Conductor Sizes for Allowable Voltage Drops
 - Identification of Conductors
 - Installation of Wire runs
 - Over-current Protection
 - Making Connections
 - Ignition Protection
 - ABYC Standard E-9

DAY 3 – 8:00AM

- ✓ AC Basics
 - Alternate Current
 - AC Safety
 - Grounding
 - Conductor Identification
 - Ground-Fault Devices
 - Transformations
 - Measuring AC
 - Troubleshooting
 - Checking Polarity

- ✓ AC Standards
 - Shore Power
 - Generator & Inverter Sources
 - Main Panelboard
 - Load Calculations
 - Over-current Protection
 - Ground Fault Protection
 - Approved Wire & Cable
 - Conductor Installation
 - Ignition Protection
 - Galvanic Protection
 - Typical Shore-Power Circuits
 - ABYC Standard E-8 & A-28