

## **ABYC Electrical Certification Program Course Outline**

The ABYC Electrical Certification Program is a four-day course designed to help prepare the attendee to sit for the 200-question certification exam. It should be pointed out that this certification and exam are not intended for the inexperienced technician, and it is not implied in any way that this course will be a suitable replacement for actual experience. What this course *will* do is act as a refresher for basic material and electrical fundamentals that may have been long forgotten by the experienced electrician. In addition, each topic area as covered on the exam will be carefully reviewed, with any specialized equipment necessary for working within the given task area discussed, and in some cases demonstrated as to its effective use. All applicable ABYC Standards will be reviewed and explained in detail as part of this course. The program will begin promptly at 8:30 AM on the first day of class and run until 3:30 PM. After the first day all starting times will be 8:00 AM and ending times will be 3:30 PM. Each day we will break at noon and take a one-hour lunch break. Each morning a practice quiz will open the day, with discussion amongst the class participants and instructor following. So, the daily material looks like this:

### **Day 1:**

Introduction, with a detailed review of the NOCTI Exam dacum and topic areas. Review of Ohm's Law and power equations. The how and why these two vital equations are applied will be covered at length. We'll move on to a look at circuit types, characteristics and problems. A practice session will apply the rules of Ohm's Law and the power equations to the various circuit types. The discussion will move on to test equipment types and recommendations for the selection of appropriate equipment for a given task. Next, we will look at battery types, characteristics and appropriate methods for testing batteries to determine their condition and suitability for a given task. The "how" of determining needed battery capacity will be discussed at length. We will look at battery "combining" methods and discuss each approach's advantages and disadvantages. In the afternoon we will begin a focused review of ABYC Standard E-9.

### **Day 2:**

The day will open with practice Quiz # 1 and discussion of it's content. A continuation of the E-9 review will follow. Next, we will review key points regarding wire and cable termination, some of which are considered experiential in nature, and some of which are Standards based. Next, we will move on to battery charging systems and methods and a detailed look at the needs of a battery and the limitations of some traditional charging systems. A review of ABYC A-20, Battery Chargers will follow. We will then move on to a look at engine driven alternator systems. Installation considerations including proper mounting and rating for the various battery types will be discussed at length.

Finally we will touch on some of the basic considerations for the selection and installation of alternative energy charging systems such as wind and solar generators.

### **Day 3:**

We'll begin with practice Quiz #2 and discussion. Next, we'll look at ABYC Standards E-10, covering batteries and their installation and move on to review ABYC A-25, DC to AC inverters. A detailed look at inverter selection and installation considerations will follow. Next, we will introduce AC systems with a review of important safety considerations and basic test procedures, and appropriate equipment to use when working with these systems. We will then review ABYC E-8, AC systems. Finally, we will discuss the study guide material covering the installation and troubleshooting of AC generators.

### **Day 4:**

The day begins with practice Quiz # 3 and a review and discussion of the content. We will move on to wiring diagram types and considerations. Next we will look at the basics for troubleshooting instrumentation systems and discuss the various methods used by different vendors of this equipment. A quick look at safety equipment such as CO monitors will follow. Next, we will begin looking at the issues related to cathodic protection systems, lightning protection systems and galvanic isolation. The day will close with a beginning look at ABYC Standards E-2, Cathodic Protection, E-4, Lightning Protection, and A-28, Galvanic Isolators.

We'll continue and complete the reviews of E-2, E-4 and A-28. Next we'll discuss the elements of successful customer service.

Finally, the instructor will provide a focused review of all course content for the week followed by a question and answer period. A one-hour lunch break will follow. After lunch, the certification exam will be given allowing 3-hours for the exam. It should be noted that all of the ABYC certification exams are timed at a 3-hour maximum.