Basic Electronic Components & Their Measurement

SERIES SPECIFICATIONS & COURSE OUTLINE

 CONTENTS
Help participants understand the fundamentals of basic electronic components, their measurement, and how they are applied with this electrical maintenance series.

 AUDIENCE
The Basic Electronic Components & Their Measurement series is designed for operators, technicians, maintenance personnel, and others who regularly work with electronic components. All terms used are explained or defined throughout the courses, so participants are not required to have an extensive technical vocabulary to understand the content.

 LEARNER EXPECTATIONS
This series is intended to be used as an essential component in your electrical/electronics maintenance curriculum. It is designed to help provide the background knowledge necessary to develop an in-depth understanding of basic electronic components and their measurement. Each lesson has specific objectives that identify the anticipated level of understanding associated with the information presented. Our experience indicates that those who complete the training are likely to accomplish the stated objectives. Furthermore, if these lessons are built into a total curriculum which includes practice in the working environment, it will help provide participants with the knowledge necessary to master the subject.
Basic Electronic Components & Their Measurement

*BEC001 Types & Diagrams*

**Purpose:** This course familiarizes participants with electronic quantities and electronic assembly testing principles, including details on how to take proper readings. It also covers various types of multimeters and their selection procedures, VOM measurements and maintenance, and finally, bridge type instruments and related measurement techniques.

**Objectives:** Become familiar with various types of electronic diagrams; become familiar with interconnection diagrams; read linear and nonlinear scale meters; calculate circuit values; understand analog and digital multimeters; list sources of measurement error with VOMs; define the procedures for measuring voltage and current with an electronic VOM; define the procedures for measuring resistance with a VOM; and explain the operation of bridge instruments.

*BEC002 Controls & Applications*

**Purpose:** This course familiarizes participants with oscilloscopes and their operating principles. It introduces to CRT manipulation techniques and various scope patterns. It also covers the capabilities of oscilloscope measurements and amplifier testing procedures.

**Objectives:** Identify the basic parts and controls of an oscilloscope and explain how they work; identify and use the vertical deflection, horizontal deflection, and triggering controls; check vertical and horizontal calibration; list the steps necessary to align and measure sine wave voltages, frequencies, and DC offset voltages; identify Lissajous figures and use them for measurement tasks; and determine an amplifier’s response to a square wave input by identifying the output waveforms.

*BEC003 Operation & Troubleshooting*

**Purpose:** This course shows participants several types of signal generators and their uses. It covers the principles and techniques of signal tracing and signal injection. It also teaches them how to test capacitors, inductors, and transformers.

**Objectives:** Operate RF generators, function and pulse generators, and counter-timers for appropriate signal-testing operations; identify the steps for troubleshooting a circuit using signal tracing and signal injection; test the functioning of capacitors and inductors; test a transformer and calculate transformer power losses; perform function and specification tests on diodes; use an ohmmeter to test silicon-controlled rectifiers and triacs; and describe the function of semiconductor testers.