Basic Electronics

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This five-day course provides technicians with an understanding of basic electronic theory and concepts. The course begins with a review of direct current fundamentals then explains semiconductors, diodes, bipolar transistors, silicon controlled rectifiers, and triacs.

I. Direct Current Review

- Basic Series Circuits
- Basic Parallel Circuits
- Series/parallel Circuits
- Ohms and Kirchoff's Law
- Calculating Current and Voltage

II. Semiconductors - Diodes

- Semiconductor Materials and Characteristics
- Semiconductor Rectifier Diodes
- Diode Biasing, Ratings and Types
- Use of Diode Data Sheets and Cross Reference Manuals
- Power Rectification in AC Circuits
- Diode Application in DC Power Supplies
- Other Types of Diodes - Light Emitting Diodes, Tunnel Diodes Gunn Diodes, Shockley Diodes
- Protection of Diode Circuits from Over Voltage and Over Current
- Testing, Troubleshooting and Repair of Diode Circuits

III. Semiconductors - Bipolar Transistors

- Transistor Construction
- Transistor Biasing, Ratings, and Types
- Use of Transistor Data Sheets and Cross- Reference Manuals
- Typical Transistor Circuit Arrangements
- Common Base Transistor Circuits
- Common Emitter Transistor Circuits
- Common Collector Transistor Circuits
- Special Considerations for Power Transistors
- Protection of Transistor Circuits from Over Voltage and Over Current
- Transistor Applications in Transistors Regulated Power Supplies
- Testing, Troubleshooting, and Repairing Transistor Circuits

IV. Semiconductors - Other Types of Transistors

- Field Effect Transistors (FETs)
- Metal Oxide Field Effect Transistors
- Special Considerations for Handling MOSFETS
- Power Mosfets and Their Applications
- Unijunction Transistors and Their Applications
- Testing, Troubleshooting, and Repairing Non- Bipolar Semiconductor Circuits

V. Silicon Controlled Rectifiers and Triacs

- SCR Construction and Theory of Operation
- Triac Construction and Theory of Operation
- Triggering of SCR and Triac Circuits
- Dv/Dt and Snubber Network Protection and Triac Circuits
- Special Considerations for Current-Limiting Fuses Used for SCR and Triac Protection
- Use of SCR and Triac Data Sheets and Cross-Reference Manuals
- Special Considerations for Power SCR's & Triacs

- Heat Sinking of Power SCR's and Triacs
- Special Considerations for Water Cooled SCR's and Triacs
- Testing, Troubleshooting, and Repair of SCR and Triac Circuits.