

INTRODUCTION TO INDUSTRIAL ELECTRONICS

CLASS FORMAT:

Classroom

STANDARD CLASS SIZE:

NTT recommends a class of 12 participants to obtain the best results.

NTT PROVIDES:

- 2 days (16 contact hours) of on-site instruction
- Textbooks and lab manuals
- Classroom consumables
- Completion certificates
- Shipping and instructor travel logistics

CLIENT PROVIDES:

- A classroom, with easy access, of 750 square feet or greater
- Projection screen, white board and/or flip chart(s)

SHIPPING:

- 2 crates at 1,550 lbs
- 1 @ 68" x 47" x 31"
- 1 @ 63" x 35" x 50"

Learn the fundamental concepts, symbols and components of electronic circuits. Sharpen your troubleshooting skills to help reduce downtime of equipment. You will work with real world industrial components and circuits and wire electronic circuits using schematic diagrams, testing the circuit for proper operation.

Participants will gain invaluable experience using and understanding common electronic test equipment, such as, oscilloscopes, signal generators, power supplies and multimeters to verify electronic operation. The course covers all aspects of industrial electronics, including Ohm's law, terminology, common circuits, test equipment, and safety. Theory and explanations support numerous hands-on exercises.

COURSE AGENDA

ELECTRONICS FUNDAMENTALS

- Repulsion and attraction
- Atomic structure
- Types of electricity
- Electrical terms and concepts
 - Voltage, current, resistance
 - Power
 - Ohm's Law

RESISTANCE AND BASIC CIRCUIT LAWS

- Resistors
- Total resistance of circuits
- Kirchoff's Voltage and current laws

TROUBLESHOOTING BASIC RESISTOR CIRCUITS

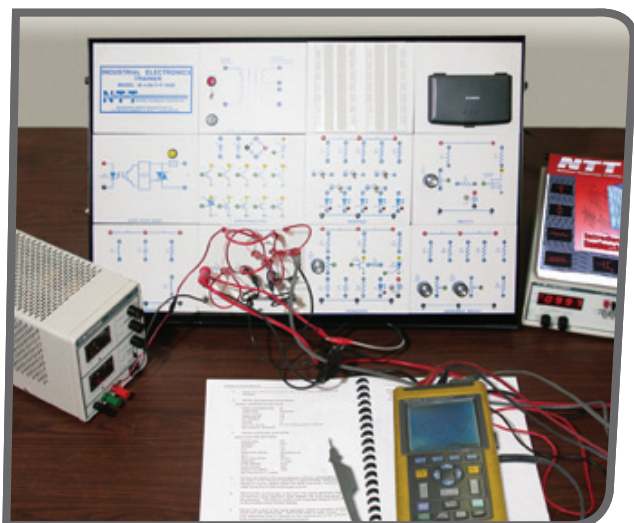
- Testing circuits: opens, shorts, grounds
- Components out of tolerance

ELECTROMAGNETICS AND INDUCTANCE

- Current flow
- Magnetic fields
- Inductors
- Transformers

CAPACITANCE

- Types and characteristics
- Testing



INTRODUCTION TO INDUSTRIAL ELECTRONICS

COURSE AGENDA, continued

AC RESISTIVE, CAPACITIVE & INDUCTIVE CIRCUITS

- Series, parallel circuits, parallel resonance
- Capacitors and resistors in series/parallel
- Inductors and resistors in series/parallel
- Resistors, capacitors, inductors in series AC

SEMICONDUCTOR DEVICES

- Diodes
- Rectifier circuits
- Bipolar junction transistors (BJTs)
- Troubleshooting bipolar transistors
- Field effect transistors
- Thyristors
- Insulated gate bipolar transistors

LINEAR INTEGRATED CIRCUITS

- Operational amplifiers
- Timing circuits
- Voltage regulators
- Op-amps

PHOTOELECTRONICS

- Characteristics of light
- Devices: LEDs, transistors, resistors
- OP AMPS and triac optoisolators

DIGITAL LOGIC

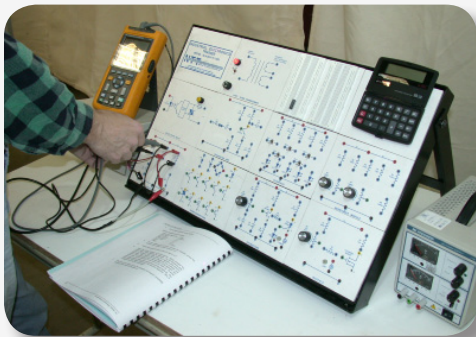
- Boolean logic
- Integrated circuit (IC) gates
- Troubleshooting logic circuits
- Microprocessors

SOLDERING CONSIDERATIONS

- Printed circuit boards
- Connectors and terminations

METERS

- Multimeters, ammeters, voltmeters, ohmmeters, AC meters, DMMs
- Obtain good readings



Participants will measure resistance and AC voltages in a series of circuits and parallel circuits.



Participants verify the function of both a three-way and four-way switch by using a DMM to test each switch. Additionally, participants will determine how to connect wires to the terminals for a complete electrical circuit that can be operated from multiple locations.