

Center for Curriculum and Transfer Articulation



## Components for Maintenance Technicians

Course: <b>PPT224EI</b>	Lecture 1 Credit(s) 1 Period(s) 1 Load
First Term: <b>2013 Summer I</b>	Course Type: <b>Occupational</b>
Final Term: <b>Current</b>	Load Formula: <b>S- Standard</b>

**Description:** Electrical component types and characteristics, such as circuit breakers and fuses, instrumentation schematics, protective relaying, and inverters.

**Requisites:** Prerequisites: PPT202 or PPT203.

### MCCCD Official Course Competencies

1. Describe the characteristics and functions of basic power plant electrical components. (I)
2. Diagnose circuit trouble using plant drawings.(II)
3. Explain the theory of operation of plant electrical components. (III)
4. Describe common failure mechanisms of plant electrical components. (IV)

### MCCCD Official Course Outline

- I. Characteristics of Power Plant Electrical Components
  - A. Transistors, bipolar junction transistor (BJT), field-effect transistor (FET), insulated-gate field-effect transistor (IGFET)
  - B. Metal-oxide-semiconductor field-effect transistor (MOSFET), silicon-controlled rectifier (SCR), and diodes
  - C. Circuit functions (such as switching amplifiers, voltage regulation, limiters, and rectification)
  - D. Circuit breakers and fuses
  - E. Construction of conductors and insulators
  - F. Electron theory
  - G. Thevenin's and Norton's theorems
  - H. Series, parallel, and combination circuits applied to Alternating Current (AC) and Direct Current (DC) circuits
  - I. Inductance, capacitance, impedance, resonance, and reactance
- II. Diagnosing Circuit Trouble
  - A. Instrumentation schematics
  - B. Control circuitry, ground detection
  - C. Protective relaying
- III. Theory of Operation
  - A. Motors (such as types and classifications)
  - B. Generators (such as types and classifications)
  - C. Transformers

1. types, functions, and operation
  2. fault symptoms and hazards
  3. safety and environmental precautions associated with cooling mediums (such as oil, air, hydrogen)
  4. fire protection systems
- D. Voltage regulators
  - E. Linear and switching power supplies
  - F. Inverters (such as battery backup systems)
- IV. Failure Mechanisms
- A. Transistors, BJT, FET, IGFET
  - B. MOSFET, SCR, and diodes
  - C. Motors
  - D. Generators
  - E. Voltage regulators
  - F. Relays
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Last MCCCD Governing Board Approval Date: **March 26, 2013**

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