

# Pennsylvania College of Technology

## Workforce Development & Continuing Education

### Overview of Direct Current Fundamentals TRS 181 Course Outline

**Course Description:** Basic principles of direct current electricity and its laws and formula are used to solve related problems. Lab work is emphasized using equipment and instruments. Troubleshooting is emphasized in hands-on exercises. You must bring a scientific calculator and are encouraged to bring a multimeter.




**Textbook:** Industrial Electricity

**Prerequisites:** None







**Course Length:** 24 hours

#### Course Outline:

##### **Language of Electricity**

-  Electrical symbols
-  Electrical drawings
-  Scientific & engineering notation

##### **Electrical Fundamentals**

-  Electric current
-  Current measurement
-  Voltage
-  Voltage measurements
-  Resistance
-  Ohm's law

##### **Electrical Power & Energy**

-  Work

- Power
- Energy
- Efficiency

#### **Test Equipment**

- Digital multimeter
- Voltage tester
- Making measurements

#### **Basic Resistive Electrical Circuits**

- Series circuits
- Parallel circuits
- Combination circuits

#### **Conductor Types & Sizes**

- Units of measurement
- Resistivity
- Electrical distribution
- Terminal connections & splices

#### **DC Generators**

- Electromagnetic induction
- Generator construction
- Generator operation
- Generator voltage
- Voltage control vs. voltage regulation
- Parallel operation of generators
- Generator efficiency

#### **DC Motors**

- Basic motor operation
- Generator action in a motor
- Motor speed
- Types of DC motors

- Motor maintenance

- **DC Electronic Variable Speed Drives**

- DC drives

- SCR armature voltage controller

- Troubleshooting DC drives