

Pennsylvania College of Technology

Workforce Development & Continuing Education

Overview of Alternating Current Fundamentals TRS 182 Course Outline

Course Description: Basic principles of alternating current electricity and the laws and formula that are used to solve related electrical problems are covered. Topics include the use of electrical meters and reading electrical diagrams and electrical distributions systems. Hands-on work is carried out in the lab. Lab work demonstrates the proper use of equipment and instruments. 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

Alternating Current

-  Basic AC theory
-  Alternating current & voltage values
-  Advantages & disadvantages of AC
-  Electromagnetic induction
-  Capacitance
-  Power in AC circuits
-  Three phase systems

AC Circuits

- Pure resistive circuits
- AC series circuits
- AC parallel circuits
- AC combination circuits

Conductor Types & Sizes

- Units of measurement
- Resistivity
- Insulation & ampacity of conductors
- Flexible cords & cables
- Electrical distribution
- Terminal connections & splices

Electrical Distribution

- Primary distribution systems
- Consumer distribution systems
- Grounding of electrical systems
- Grounding of electrical equipment
- Ground-fault protection
- Three-phase systems

AC Generators (Alternators)

- Alternator construction
- Alternator voltage output
- Voltage & frequency control
- Alternator characteristics
- Paralleling Alternators

AC Motors

- AC motor construction
- Three-phase motor theory
- Three-phase motor starting & running current

- Types of three-phase motors
- Single-phase motors
- Starting single-phase motors
- Universal motors
- Selection of single-phase motors
- Torque motors
- Dual-voltage windings
- Multi-speed induction motors

Motor Control Devices & Circuits

- Motor control devices
- Operating methods
- Controlled devices
- Motor starters
- Motor control circuits
- Multiple start/stop controls
- Braking

AC (Inverter) Drives

- Inverter drives
- Flux vector drives