

Unit Lesson Plan

Trimester	Trimester 2	Document #	EM401.ULP01
Subject Syllabus	Direct Current Theory		
Unit	Unit 1 – DC Theory		
Unit Duration	Scheduled – 24 Hours / 5 Days		
Duration of Lecture	Duration of Practical Activities	Duration of Assessment	
Estimated at 4 Hours	Estimated at 19 Hours	1 Hour	

Lesson Objectives

Learning Outcomes

When the student completes these lessons, they should be able to:

- Describe Ohm's law
- Describe the basic formula for finding power (in watts)
- Understand Kirchoff's first and second laws as they relate to DC circuits
- Describe how current, voltage, resistance, and power flow through series and parallel DC circuits
- Calculate values of current, voltage, resistance, and power flow in DC series and parallel circuits
- Explain some techniques for evaluating DC circuit performance
- Troubleshoot and maintain DC Power Supplies as they apply to programmable logic controllers, variable frequency AC motor drives, DC motor drives, and proximity and photoelectric controls.

Enabling Objectives

- Explain Ohm's as it relates to DC circuits
- Describe the formula for determining power in a DC circuit
- Explain Kirchoff's current law using a DC circuit example
- Explain Kirchoff's voltage law using a DC circuit example
- Explain the manner current flows through DC series and parallel circuits
- Describe the method of determining voltage in DC series and parallel circuits
- Explain calculating resistance in DC series circuits
- Describe the calculations of power in DC series and parallel circuits
- Explain some techniques for evaluating DC circuit performance
- Draw a block diagram of DC power supply
- **Draw schematic symbols** for power supply components
- Testing a Transformer
- Locate diodes and symbols

- Test a diode
- Draw a half-wave rectifier
- Connect and operate a half-wave DC power supply
- Confirm full-wave DC power supply operation
- Connect and operate a full-wave DC power supply
- Confirm single-phase bridge rectifier operation
- Connect and operate a single-phase bridge rectifier

Lecture - Learning Resources

Unit Lecture Resources:

Instructor access - Using your browser, connect to the HIWPT Intranet site -

martechlms.hiwpt.edu/martech_courses (do not include <https://www>. in your address)

- Martech Media 401-03 Ohm's and Kirchhoff's Laws Relating to DC Circuits
- Martech Media 401-04 Evaluating Series and Parallel DC Circuit Performance
- Intelitek EB02A: Introduction to DC Power Supplies

Unit Specific Handouts:

Martech Media Student Guides: 401 Series Guides

Practical Activities

Laboratory Activity # EIC201.ULP01.LA01 Measuring Voltage and Current in Series Circuit

Prior to laboratory activities, you must have completed the lecture material

Martech Media 401-03 and 401-04 and Intelitek EB02A: Introduction to DC Power Supplies

Necessary Lab Equipment:

1. Multi-meter
2. LD Didactic Plug-and-Play components (resistor, bread board, connecting leads, switch).
3. Power supply

Laboratory Activity # EIC201.ULP01.LA02 Measuring Voltage and Current in Parallel Circuit

Prior to laboratory activities, you must have completed the lecture material

Martech Media 401-03 and 401-04 and Intelitek EB02A: Introduction to DC Power Supplies

1. Multi-meter
2. LD Didactic Plug-and-Play circuit components
 - 1 Plug-in board, DIN A4 576 74
 - 1 STE resistor 10 Ω , 2 W, 5 % 577 20
 - 1 STE bulb holder E10, side-mounted 579 05
 - 2 STE changeover switches, single-pole 579 15
 - 1 Pair of connecting leads, red/blue, 50 cm 501 45
 - 1 Set of 10 bridging plugs
 - 1 Light bulb, 2.5 V/ 0.1 A
3. Power supply

Laboratory Activity # EIC201.ULP01.LA03 Connecting Electric Circuit with Two Switches
Connected in Parallel

1. Multi-meter
2. LD Didactic Plug-and-Play circuit components
 - 1 Plug-in board, DIN A4 576 74
 - 1 STE resistor 10 Ω , 2 W, 5 % 577 20
 - 1 STE bulb holder E10, side-mounted 579 05
 - 2 STE changeover switches, single-pole 579 15
 - 1 Pair of connecting leads, red/blue, 50 cm 501 45
 - 1 Set of 10 bridging plugs
 - 1 Light bulb, 2.5 V/ 0.1 A
3. Power supply

Laboratory Activity # EIC201.ULP01.LA04 Connecting an Electric Circuit with Two Switches
Connected in Series

1. Multi-meter
2. LD Didactic Plug-and-Play circuit components
 - 1 Plug-in board, DIN A4 576 74
 - 1 STE resistor 10 Ω , 2 W, 5 % 577 20
 - 1 STE bulb holder E10, side-mounted 579 05
 - 2 STE changeover switches, single-pole 579 15
 - 1 Pair of connecting leads, red/blue, 50 cm 501 45
 - 1 Set of 10 bridging plugs
 - 1 Light bulb, 2.5 V/ 0.1 A
3. Power supply

Assessment

Written Assessment

Assessment may be in the form of any of the following:

- Multiple Choice
- Fill in the Blank
- True or False
- Essay
- Matching
- Short Answer