

# Minnesota State College Southeast

## **ELEC 1209: DC Theory & Circuits**

### **A. COURSE DESCRIPTION**

Credits: 2

Lecture Hours/Week: 1

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course covers the study of Ohm's Law, Kirchoff's Law and network theorems, with an emphasis on the theoretical concepts as related to electricity/electronics. The application of DC theory through laboratory experiments are also examined. Instruction in the operation of basic test equipment is used to provide verification of topics and to reinforce the theory. (Prerequisite or Concurrent PHYS1515 or ELEC1202) (2 credits: 1 lecture/1 lab)

**B. COURSE EFFECTIVE DATES:** 12/18/2015 - Present

### **C. OUTLINE OF MAJOR CONTENT AREAS**

1. Analyze shorts and open circuits
2. Apply Kirchoff's Laws
3. Apply network theorems
4. Troubleshoot circuits using proper test equipment

## **D. LEARNING OUTCOMES (General)**

1. Identify open and closed circuits
2. Describe electronic terms
3. Calculate resistor power dissipation
4. Convert numbers to metric prefixed form
5. Identify safe working conditions
6. Calculate circuit values using Ohm's law
7. Define work, energy and power
8. Identify voltage and current limitations of devices
9. Identify series circuits
10. Solve for series circuit parameters
11. Use proper safety habits
12. Define concept of maximum power transfer
13. Analyze voltage polarities in reference to ground
14. Analyze shorts and opens in series circuits
15. Identify parallel circuits
16. Solve for parallel circuit parameters
17. Analyze shorts and opens in parallel circuits
18. Identify series-parallel circuits
19. Solve for series-parallel circuit parameters
20. Define polarity and ground reference of voltage divider circuits
21. Apply Kirchhoff's Laws
22. Define concepts of bridge circuits
23. Calculate the RC time constant
24. Analyze electrical components
25. Analyze electrical equipment schematics
26. Describe voltage sources
27. Use a DMM to measure resistance
28. Analyze potentiometers
29. Use a DVM to measure voltage
30. Use a DMM to measure current
31. Calculate series circuit parameters
32. Construct series circuits
33. Troubleshoot series circuit
34. Describe internal resistance
35. Calculate circuit series power
36. Calculate parallel circuit power
37. Calculate unloaded voltage divider parameters
38. Construct voltage divider circuits
39. Analyze voltage divider circuits
40. Construct bridge circuits
41. Analyze bridge circuits

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted