

# Minnesota State College Southeast

## **ELEC 1216: Introduction to Solid State**

### **A. COURSE DESCRIPTION**

Credits: 6

Lecture Hours/Week: 3

Lab Hours/Week: 6

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

A theoretical understanding of solid-state devices, which includes diodes, bipolar transistors, field effect transistors, SCR's, triacs, and others, and their operation in both DC and AC circuits will be covered. Analysis of these operations will be demonstrated through the lab exercises and proper use of test equipment. Understanding of waveforms, reactance, phase angles, time constants, resonant circuits, and proper biasing of solid state devices is stressed. (Prerequisites: ELEC1202, ELEC1204) (6 credits: 3 lecture/3 lab)

**B. COURSE EFFECTIVE DATES:** 10/14/1998 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

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

1. Analyze series capacitive circuits
2. Analyze series resonance circuits
3. Analyze zener diode characteristics
4. Apply electronic lab safety
5. Build rectifier circuit
6. Build regulator circuit
7. Build transistor circuit
8. Calculate combination circuit parameters
9. Calculate DC parameters
10. Calculate power gain
11. Calculate RC circuit parameters
12. Describe an AC generator
13. Describe bipolar junction transistor construction
14. Describe bipolar junction transistor operation
15. Describe capacitor characteristics
16. Describe diode characteristics
17. Describe diode operation
18. Determine waveform period
19. Determine waveform values
20. Identify 3 terminal regulator
21. Identify amplifier circuit
22. Identify bridge rectifier circuit
23. Identify diode symbol
24. Identify FET symbol
25. Identify full-wave rectifier circuit
26. Identify half-wave rectifier circuit
27. Identify transistor symbol
28. Identify voltage doubler circuit
29. Identify waveforms
30. Identify zener diode regulator
31. Identify zener diode symbol
32. Measure transformer voltages
33. Measure transistor biasing
34. Operate a function generator
35. Operate an oscilloscope
36. Test bipolar transistor
37. Test diode
38. Test FET

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted