

# Dakota County Technical College

## **BMET 1116: Solid State Electronics**

### **A. COURSE DESCRIPTION**

Credits: 5

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course will introduce students to a wide range of active solid state devices such as transistors, unijunction transistors, and silicon-controlled rectifiers. It also teaches how these devices are used in practical circuits such as amplifiers, speed controls, switching circuits, and timing circuits. The student will compute component and circuit parameters. These will then be compared with measured data. Circuits will be designed and evaluated by breadboarding and/or computer simulation software.

Prerequisites: None.

**B. COURSE EFFECTIVE DATES:** 08/21/2006 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

**D. LEARNING OUTCOMES (General)**

1. Compare different type transistors
2. Define D.C. bias
3. Describe base bias
4. Describe bipolar transistor characteristics
5. Describe collector feedback bias
6. Describe emitter bias
7. Describe emitter feedback
8. Describe test procedures
9. Describe transistor specifications
10. Describe voltage divider bias network
11. Determine transistor alpha
12. Determine transistor beta
13. Determine transistor parameters
14. Identify Q point
15. Identify transistors using ohmmeter
16. Match transistor pairs
17. Use data specifications sheets
18. Use transistor tester
19. Verify base bias network
20. Verify voltage divider bias network
21. Analyze SCR characteristics
22. Analyze SCR circuits
23. Analyze UJT characteristics
24. Analyze UJT circuits
25. Analyze common base amplifiers
26. Analyze common collector amplifiers
27. Analyze common emitter amplifiers
28. Analyze diac characteristics
29. Analyze diac circuits
30. Analyze triac characteristics
31. Analyze triac circuits
32. Analyze trigger device waveforms
33. Compare different type trigger devices
34. Define SCR circuits
35. Define UJT circuits
36. Define diac characteristics
37. Define diac circuits
38. Define phase control
39. Define silicon-controlled rectifiers (SCR) characteristics
40. Define triac characteristics
41. Define triac circuits
42. Define unijunction transistor characteristics
43. Describe FET characteristics
44. Describe amplifier classes

45. Describe small signal amplification
46. Describe transistor A.C. equivalent circuits
47. Determine FET voltage gain
48. Determine GM
49. Explain FET self-bias
50. Explain transconductance
51. Test AC limits
52. Test FET self-bias
53. Test SCR devices
54. Test UJT devices
55. Troubleshoot FET amplifiers
56. Troubleshoot trigger device circuits
57. Use FET data specification sheets
58. Verify collector feedback bias
59. Verify multistage amplifier operations

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted