

Minnesota State College Southeast

ELEC 2211: Digital Electronics II

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 2

Lab Hours/Week: 4

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

Digital electronics are so widely used that it is almost impossible to think of electronic equipment without them. Digital circuits have greatly improved electronic methods and have given practical electronic equipment amazing capability. In this course you will learn what digital electronics is, how they are used to reduce board area, improve reliability and increase performance. (Prerequisite: ELEC1212) (4 credits: 2 lecture/2 lab)

B. COURSE EFFECTIVE DATES: 02/11/2004 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

D. LEARNING OUTCOMES (General)

1. Discuss the benefits of digital techniques
2. Verify OR gate operation
3. Verify NOT gate operation
4. Distinguish between digital and linear circuits
5. Verify AND gate operation
6. Verify NOR gate operation
7. Verify NAND gate operation
8. Verify XOR gate operation
9. Verify XNOR gate operation
10. Determine binary state
11. Interpret data sheets
12. Locate specifications on a data sheet
13. Convert decimal, binary and hexadecimal number systems
14. Add binary numbers
15. Verify universal gate operation
16. Formulate using 2's complement
17. Learn number conversions
18. Convert between numbering systems
19. Compare categories of computers
20. Identify the NOT gate, its symbol, function, truth table and Boolean expression
21. Describe numbering systems
22. Identify the OR gate, its symbol, function, truth table and Boolean expression
23. Investigate the equivalence of Boolean expressions
24. Identify the AND gate, its symbol, function, truth table and Boolean expression
25. Verify the laws and theorems of Boolean algebra by measurement
26. Identify the NOR gate, its symbol, function, truth table and Boolean expression
27. Identify the NAND gate, its symbol, function, truth table and Boolean expression
28. Identify the XOR gate, its symbol, function, truth table and Boolean expression
29. Identify the XNOR gate, its symbol, function, truth table and Boolean expression
30. Analyze positive and negative logic
31. Determine the effect of an open input
32. Draw a network of logic symbols for an expression
33. Convert numbering systems
34. Verify multiplexer operations
35. Manipulate Karnaugh maps
36. Verify Boolean function generator operation
37. Simplify a Boolean expression
38. Verify 1-of-4 decoder operation
39. Design logic circuits
40. Verify BCD decoder operation
41. Verify LED display characteristics
42. Verify seven-segment driver operation
43. Verify 8-input encoder operation
44. Verify decimal encoder operation

45. Verify priority
46. Define instruction word formats
47. Verify program operation
48. Verify half-adder operation
49. Interpret parameters of logic circuits
50. Compare bipolar logic families
51. Verify full-adder operation
52. Verify arithmetic logic unit operation
53. Compare TTL logic devices
54. Discuss proper interfacing techniques
55. Classify three-state devices
56. Identify advantages and disadvantages of CMOS devices
57. Analyze interfacing techniques
58. Analyze Boolean algebra
59. Analyze multiplexers
60. Analyze decoders
61. Verify TTL switching points
62. Demonstrate ESD handling precautions
63. Verify TTL fanout
64. Analyze encoders
65. Verify TTL to CMOS interface circuits
66. Analyze demultiplexers
67. Verify CMOS fanout
68. Analyze parity checkers
69. Measure control signals
70. Validate ASCII code
71. Analyze RS type flip-flops
72. Verify RS flip-flop operation
73. Verify JK flip-flop operation
74. Analyze D type flip-flops
75. Analyze JK type flip-flops
76. Verify down counter operation
77. Analyze asynchronous counters
78. Analyze synchronous counters
79. Determine the modulus of a counter
80. Identify the 4 types of shift registers
81. Verify up counter operation
82. Construct shift register

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted