

# Dakota County Technical College

## ELLW 1162: Transformers II

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course covers the actual mounting and connecting of the transformers to the primary and secondary systems, including the use and installation of over-current and over-voltage protection. The use of closed and open banks will be applied, as well as the paralleling of same. Safety of both the primary and secondary applications will be covered and used in all applications. Prerequisites: Concurrent enrollment in ELLW1160

**B. COURSE EFFECTIVE DATES:** 03/21/1998 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

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

1. apply bank paralleling procedures
2. apply burned out transformer change dead
3. apply burned out transformer change energized
4. apply correct bank closing procedures
5. apply correct bank opening procedures
6. apply correct fusing to cutouts
7. apply correct hot line tool usage
8. apply correct wire placements for connections
9. apply four bushing secondary connections
10. apply jumper stand offs secondaries
11. apply personal protective grounding
12. apply three bushing secondary connections
13. apply transformer back feed practices and protection
14. apply transformer circuit grounding
15. apply transformer lifting gin
16. apply transformer polarity changes
17. apply transformer primary grounding protection
18. apply trouble shooting techniques
19. apply two bushing secondary connections
20. calculate closed bank capacities
21. calculate open bank capacities
22. calculate tap changer voltages
23. change rotation direction with the primary
24. change rotation direction with the secondary
25. construct a cluster mount bank
26. construct a corner grounded delta service
27. construct a delta-delta P/L 0 degree bank
28. construct a delta-delta power 180 degree bank
29. construct a delta-wye P/B 210 degree bank
30. construct a delta-wye P/L 210 degree bank
31. construct a wye-delta P/B 210 degree bank
32. construct a wye-delta P/L 30 degree bank
33. construct a wye-wye P/L 0 degree bank
34. construct a wye-wye P/L 180 degree bank
35. construct an open delta open delta P/L 0 degree bank
36. construct an open delta open delta P/L 180 degree bank
37. construct an open wye open delta P/L 210 degree bank
38. construct an open wye open delta P/L 30 degree bank
39. construct an open wye open delta power 210 degree bank
40. construct an open wye open delta power 30 degree bank
41. construct delta-delta power 0 degree bank
42. construct delta-wye P/B 30 degree bank
43. construct single phase parallel bank
44. construct single phase primary system

45. construct single phase service
46. construct three phase primary system
47. construct three phase secondary
48. define parallel coil out puts
49. define series coil out puts
50. define transformer winding ratios
51. determine paralleled single phase capacities
52. determine three phase bank capacities
53. form secondary jumper drip loops
54. identify a delta corner grounded service
55. identify delta corner grounded service
56. identify delta system characteristics
57. identify duplex service wire
58. identify quad-plex service wire
59. identify tap changer requirements
60. identify the high phase
61. identify three phase secondary use options
62. identify tri-plex service wire
63. identify wye system characteristics
64. install jumper saddles
65. install jumper stand offs primary
66. install primary jumpers
67. install secondary jumpers
68. install single phase service hardware
69. install three phase over current protection
70. install three phase over voltage protection
71. install three phase service hardware

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted