Course Description: This course covers reclosures, circuit breakers and protective devices such as fuses, lightning arrests, cut-outs, sectionalizers and the related equipment. 2 Cr (1 lect/pres, 1 lab, 0 other. 3 hours per week)

Course Focus: Covered are such things as reclosure testing, inspection and causes of malfunction. Fuse construction and coordination. Coordination scheme that provides system protection along with lightning arrestors, fault indicators and relays.


Course Goals: The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. All goals will be completed except if time does not allow.

Course Focus

1. Learn safety precautions
2. Identify protective equipment
   a. Low voltage protection
   b. High-voltage protection
   c. Extra high-voltage protection
   d. Maintenance and operation hazard
   e. Safety equipment required
3. Describe control components
   a. Overcurrent relay function
   b. By-pass procedures
   c. Directional relay purpose
   d. Line disconnects purpose
   e. Phase angle
   f. Specifications
   g. Protective equipment
   h. Pilot wire scheme
   i. Mechanism of quick-break
4. Inspect mechanical wear points
5. Explain relay coil function
   a. Safe work procedures
   b. Effective voltage
   c. Oil dielectric test
   d. Proper test set-up
e. oil filtering operation
f. PCB hazards procedure
g. transfer trip purpose
6. define oil level indicator
   a. by-pass operations
   b. protective equipment
7. recite ansi device numbers
8. draw circuit & devices schematic
9. examine moisture absorbent liners
   a. gasket conditions
10. replace high-voltage bushings
11. simulate safe work practices
12. interpret reclosure load chart curves
13. connect reclosure test equipment
14. operate manual trip device
15. calculate circuit coordination
16. simulate down stream loads
17. adjust timing sequence durations
18. record test data
19. interpret load charts
20. inspect anti-pump components
21. pass final exam

STUDENT CONTRIBUTIONS: Each student will spend at least 4 hours per week preparing for class. Attendance is critical in this class: Each class worth 15 points, late for class 10 points, call for absence 5 points, do not show up or notify –10 points. Excuse two absences.

COURSE EVALUATION: Your performance, worksheets and tests will be converted to percent. A (100-94), A- (93-90), B+ (89 -87), B (86-84), B- (83-80), C+ (79 -76), C (75-72), C- (71-67), and F (below 67)

COURSE SCHEDULE: The class meets for 1 lecture hour and 2 lab hours per week.

The information in this course outline is subject to revision

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.
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