COURSE INFORMATION FORM

DISCIPLINE  INTE
COURSE TITLE  Fusing, Substations and Voltage Regulation
CR.HR  3  LECT HR  1  LAB HR  4  CLIN/INTERN HR  CLOCK HR

CATALOG DESCRIPTION
The student will be familiarized with the different types and methods of system coordination, substations, capacitors, voltage regulators and auto-transformers, oil reclosures, sectionalizers and the application/coordination of fuses will also be gained. Practical experience in the grounding, inspection, maintenance and operation of basic substations will be expanded. The student will be familiarized with installation and operation of single and three-phase regulators, gang operated air break and load break switches, and substation fuses and reclosures.

PREREQUISITES
LINE 241

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:
1. Demonstrate safe work practices.
2. Identify symbols used in one-line diagrams.
3. Perform operating procedures for fused cutouts.
4. Describe and use the loadbreak tool.
5. Demonstrate skill to properly size fuses.
6. Demonstrate operation of various types of fuses.
8. Describe operation and purpose of substations.
9. Demonstrate an understanding of SCADA and voltage regulation.
10. Describe proper grounding methods used in substations.
11. Describe substation grounding grid and safety requirements.

GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

Critical Thinking:
B. Define, analyze and evaluate information, materials and data (ESO) (2, 6, 9, 10)
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The student will demonstrate:
1. The ability to apply foundational skills in an industrial setting, safely and to industry guidelines.
2. Professional oral and written communication skills.
3. Thinking critically and applying problem-solving skills.
4. Competency in the entry-level skills required to graduate from Electric Utility Line Technician program.
5. Certified competency in electrical safety.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

Written Tests: 1 - 8
Assignments: 1, 4, 6, 9, 10, 11
COURSE OUTLINE FORM

DISCIPLINE   INTE

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Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Safety and Hazards in Substations and fusing
II. Fusing
   A. Types
   B. Sizing
   C. Ratings
III. Define Substation
    A. Switchgear
    B. Bus
    C. Transformer
IV. Types of Substations
    A. Transmission and Distribution
    B. Step-up/Step-down
    C. Mobile
V. Voltage Regulation
   A. Definition
   B. Types
VI. Equipment
VII. Operation and Maintenance Programs