Electrical Power Distribution (ELPT 2339)

Credit: 3 semester credit hours (1 hour lecture, 6 hours lab)

Prerequisite/Co-requisite: ELPT 1321

Course Description

Design, operation, and technical details, of modern power distribution systems; including generating equipment, transmission lines, plant distribution and protective devices. Includes; calculations of fault current, system load analysis, rates and power economics.

Required Textbook and Materials

1. Electrical Essentials For Powerline Workers, Wayne Van Soelen
   a. ISBN number: 0-7668-1080-1
2. OSHA handouts
3. Handout literature

Course Objectives

Identify major parts of utility systems; compare overhead systems versus underground systems; discuss mechanical design considerations to meet codes, standards, climate, and terrain relating to the utility systems; explain electrical considerations for utility line; and relate the economics involved with utility systems.

1. Identify major parts of a utility system.
2. Discuss overhead and underground distribution system operations.
3. Discuss mechanical design consideration to meet codes, standards, climate, and terrain relating to utility systems.
4. Apply electrical considerations for utility lines.
5. Apply and relate economics involved with utility systems.
6. Perform revenue meter operation and applications.
7. Perform utility line maintenance using hotstick tools.
8. Apply and observe all relevant safety rules and procedures.

Course Outline

I. Revenue Metering
   A. single phase meters
   B. three phase meters
   C. voltage tests
   D. meter theory
   E. electronic meters
   F. meter demand
   G. transformer rated metering
   H. multipliers and ratios
   I. field checking meters
   J. setting and removing meters
   K. theft
   L. reading clock dial and demand meter

II. Substation

Approved 12/2013

A. types
B. typical layout
C. nominal voltages
D. transformer
E. voltage regulation
F. busses
G. switch gear
H. switching procedures
I. safety, OSHA 1910.269
J. inspection

A. underground basics
B. OSHA 1910.269 safety
C. tools
D. grounding
E. transformers
F. risers and terminators
G. elbows
H. conduit
I. installing URD cable
J. troubleshooting
K. vaults

III. Underground Distribution

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

Activity	***Percentage***
Daily grades	20%
Metering Exam	20%
Underground Exam	20%
Underground Practical 1	15%
Underground Practical 2	15%
Substation Exam	10%
Total	***100%***

Grade points will be awarded in accordance with the college catalog.

1. Assignments are due on the due date assigned. Late assignments are not accepted.
2. Tests must be taken on the announced date.
3. Daily grades include participation in classroom labs and skill level evaluations.

Course Requirements

1. Assemble and install meter applications
2. Check connections, voltages, and safely install meters
3. Properly describe, inspect, and wear all necessary PPE required.
4. Properly read electromechanical and electronic meters.
5. Calculate billing from KWHH usage

6. Properly field check revenue meter installations
7. Perform switching and isolation procedures for URD
8. Perform cable URD termination
9. Install and locate URD cable
10. Troubleshoot URD cable
11. Practice all safety procedures
12. Demonstrate knowledge of distribution substation operation

Attendance Policy:

1. Class attendance is important to obtain the educational objectives of this course. Prospective employers may also review your attendance records. Regular attendance and being on time for classes will have a positive effect on your academics and employment opportunities.
2. Two absences will result in 1 letter grade drop, three absences drop 2 letter grades.
3. **Four absences result in an F for the semester.**

Course Policies

1. No food or drinks in class.
2. Daily lab grades cannot be made up.
3. No make ups for lab tests.
4. Any written test retake has a 80 points as the maximum grade
5. LIT is a tobacco free campus- no tobacco products allowed
6. Students must follow safety rules and procedures at all times. Failure to follow safety rules will require action from daily grade reduction to expulsion from LIT.
7. Students must have and wear **all required clothing including climbing boots at all times,** and have PPE and tools for participation in ***class and Lab***.
8. **Turn off all Cell Phones during class, labs and when on the field**. Unauthorized cell phone use will result in a 0 for the daily grade.
9. Do not bring children to class.
10. Cheating of any kind will not be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result from expulsion from LIT.
11. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
12. Internet Usage
    a. Classroom computers have access to the internet.

b. Internet usage is monitored.
c. Proper usage of the internet will be allowed. Used for classroom research or as directed.
d. Any unauthorized use of the internet will not be tolerated.
e. Improper usage of the internet, such as profanity, pornography, gambling, etc… will result in disciplinary action not limited to expulsion from LIT.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic	Reference
1	Course introduction and policies • Lecture – Revenue metering • Lab: Meter types	Handouts
2	Revenue metering • Lecture • Lab: Meter applications	Chapter 12
3/4	Revenue Metering • Lecture • Lab: Installing meters, meter reading • Project: Install transformer rated meter set • Exam	Chapter 12
5/6	Underground Distribution • Lecture • Lab: Underground safety	Handouts
7/8	Underground Distribution • Lecture • Lab: Underground tools and equipment	Chapter 9,10
9/10	Underground Distribution • Lecture • Lab : Underground terminations • Project: As Assigned	Chapters 9,10
11/12	Underground Distribution • Lecture • Lab : Underground terminations/cable installation	Chapters 9,10

Week	Topic	Reference
	• Project: As Assigned	
13/14	Underground Distribution • Lecture • Lab : Underground Switching • Project: As Assigned • Written exam, Underground practical 1 and 2	Chapters 9,10
15/16	Substation • Lecture • Lab: Switching and isolation • Substation Exam	Handouts

Contact Information:

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