ELECTRICAL LINE WORKER 4
COURSE CODE: 6308

COURSE DESCRIPTION: The Electrical Line Worker 4 course prepares the student to enter the electric utility industry as an apprentice with a broad understanding of the skills, knowledge, safe work practices and physical ability required to perform line work. Students receive classroom and field training in math, electrical circuit analysis, power systems including Ohm's Law, AC and DC theory and analysis, generation, transmission and distribution of electrical energy and transformer theory. Climbing techniques are strongly emphasized. Safety and teamwork are demonstrated and emphasized in all phases of training. Program completers will have an opportunity to demonstrate career-readiness with certification achievement.

OBJECTIVE: Given the necessary equipment, supplies, and facilities, the student will complete all of the following core standards successfully.

CREDITS:	1 (120 hours), 2 (240 hours) units per course code
PREREQUISITE(S):	Electrical Line Worker 3 with passing Grade "C"
RECOMMENDED GRADE LEVEL:	10 - 12
COMPUTER ACCESS REQUIRED:	1 Computer per student with Internet access
RECOMMENDED ENROLLMENT:	12
RECOMMENDED CURRICULUM:	T&D Lineman Training

A. STUDENT ORGANIZATIONS

Proficient professionals know the academic subject matter, including professional development, required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.
3. Explain the benefits and responsibilities of being a member of a CTSO.
4. List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.

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B. TECHNOLOGY KNOWLEDGE

Effective professionals know the academic subject matter, including the ethical use of technology as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., piracy; cyberbullying, illegal downloading; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).
5. Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, Creative Commons, and other elements for personal use.
6. Describe ethical and legal practices of safeguarding the confidentiality of business-related information.
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.

C. PERSONAL QUALITIES AND EMPLOYABILITY SKILLS

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate punctuality.
2. Demonstrate self-representation.
3. Demonstrate work ethic.
4. Demonstrate respect.
5. Demonstrate time management.
6. Demonstrate integrity.
7. Demonstrate leadership.
8. Demonstrate teamwork and collaboration.
9. Demonstrate conflict resolution.
10. Demonstrate perseverance.
11. Demonstrate commitment.
12. Demonstrate a healthy view of competition.
13. Demonstrate a global perspective.
14. Demonstrate health and fitness.
15. Demonstrate self-direction.
16. Demonstrate lifelong learning.

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D. PROFESSIONAL KNOWLEDGE

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate effective speaking and listening skills.
2. Demonstrate effective reading and writing skills.
3. Demonstrate mathematical reasoning.
4. Demonstrate job-specific mathematics skills.
5. Demonstrate critical-thinking and problem-solving skills.
6. Demonstrate creativity and resourcefulness.
7. Demonstrate an understanding of business ethics.
8. Demonstrate confidentiality.
9. Demonstrate an understanding of workplace structures, organizations, systems, and climates.
10. Demonstrate diversity awareness.
11. Demonstrate job acquisition and advancement skills.
12. Demonstrate task management skills.
13. Demonstrate customer-service skills.

E. LOAD CALCULATIONS – FEEDERS AND SERVICES

Proficient electrical line workers demonstrate appropriate knowledge and skills for basic load calculations for residential and commercial applications as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Explain basic load calculations for residential and commercial including raceway fill, conductor de-rating, and voltage drop.

F. EXCAVATION EQUIPMENT USAGE AND MAINTENANCE

Proficient electrical line workers demonstrate appropriate use and maintenance of excavation equipment, as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Explain the proper use of excavation equipment in the installation of underground utilities.
2. Explain safe maintenance procedures and operations of excavation equipment.
3. Explain proper installation of underground power lines.
4. Explain proper grounding techniques.

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G. SPECIALTY TRANSFORMERS

Proficient electrical line workers demonstrate appropriate knowledge and skills for installing various types of specialty transformers as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Identify and describe various types of transformers.
2. Proper safety precautions working with specialty transformers.

H. MEDIUM-VOLTAGE TERMINATIONS/SPLICES

Proficient electrical line workers demonstrate appropriate knowledge and skills for making splices and terminations as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Describe how to splice medium-voltage cable.
2. Describe termination classes and important considerations when creating terminations.
3. Define high-potential testing and explain how such testing is conducted.

I. UNDERGROUND SWITCHGEAR OPERATIONS

Proficient electrical line workers demonstrate appropriate knowledge and skills in underground switchgear operations as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Explain proper use and maintenance of underground tools.
2. Explain safety and proper use of PPE for underground systems.
3. Explain the operations of underground switchgears.
4. Explain the operations of elbows and risers.

J. FUNDAMENTALS OF CREW LEADERSHIP

Proficient electrical line workers demonstrate appropriate knowledge and skills for managing crews, including leadership, safety, and project control as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Describe current issues and organizational structures in industry today.
2. Explain how to incorporate leadership skills into work habits, including communications, motivation, team-building, problem-solving, and decision-making skills.
3. Identify a crew leader's typical safety responsibilities with respect to common safety issues, including awareness of safety regulations and the cost of accidents.

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4. Demonstrate a basic understanding of the planning process, scheduling, and cost and resource control.

K. PROFESSIONAL DEVELOPMENT

Proficient electrical line workers demonstrate appropriate knowledge and skills for working in the electrical line worker industry as needed in their role. The following accountability criteria are considered essential for students in the Electrical Line Worker program of study.

1. Prepare and acquire appropriate electrical line worker certification.
2. Prepare pre-employment documents for placement following program completion, e.g., resume', portfolio, certification(s).

Course Materials and Resources

Academic Standards and Indicators

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