Casper College Course Syllabus

Eltr 1545
Utility Locator Certification

Semester/Year: Spring 2015

Lecture Hours: 1.5 Lab Hours: 1 Credit Hours: 2.0

Class Time: 8 AM to 4:40 PM Days: M-F Room: EI 109

Instructor’s Name: Bill Mixer

Instructor's Contact Office Phone: 2670 Email: wmixer@caspercollege.edu
Information: Office: GW 116E

Office Hours: M – F 7:30 AM-7:50 AM in EI 109

Course Description:

Fundamentals of underground utility location will be covered. This will include the methods used to change the transmitter current levels, change the shape of the magnetic field, how to measure the magnetic field with the receiver, and how to produce a round magnetic field and verify depth. Successful completion of this course will result in certification as an Underground utility Locator through Staking University.

Statement of Prerequisites: None

Goals:

Upon completion of this course, the student will:

1. Demonstrate how to measure current with a transmitter and receiver unit.
2. Demonstrate how to determine signal shape with a transmitter and receiver unit.
3. Identify utility lines using a transmitter and receiver unit.

Outcomes:

The student will:

1. Demonstrate how to properly read and access the induced current level on an underground utility line, if current is detected.
2. Demonstrate how to produce current on a utility line, if current is not detected.
3. Demonstrate the methods for increasing or decreasing the current level on an underground utility line.
4. Demonstrate at least three methods to determine whether the magnetic signal shape is circular or non-circular.
5. Demonstrate the different methods that may produce a circular magnetic field when a non-circular magnetic field is detected.
6. Demonstrate the methods that are used to identify a target utility line in a given area.
7. Demonstrate the methods that are used to determine the absence of target utility lines in a given area.
8. Demonstrate how to find the depth of an underground utility.

Methodology:

This is a lecture/laboratory course that covers five days. Students will spend twenty-four hours in lecture and field demonstrations covering the theory material for utility location during the five day course. Students will spend sixteen hours in an outdoor laboratory using the location concepts, covered in the lecture, to locate utility lines on the Casper College campus.

Evaluation Criteria:

Student comprehension of material covered in the lecture will be evaluated through a written test and a practical test.

The grading criteria will be Pass/Fail.

Students who successfully complete this course will gain certification as an Underground Utility Locator through Staking University.

Required Text, Readings, and Materials:

None

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade:

Please refer to the current Casper College Catalog.

Student Rights and Responsibilities:

Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command:

If you have any problems with this class, you should first contact the instructor in order to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take your problem through the appropriate chain of command starting with the department head, then the division chair, and lastly the vice president for academic affairs.
Academic Dishonesty - Cheating & Plagiarism:

Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct.

ADA Accommodations Policy:

It is the policy of Casper College to provide appropriate accommodations to any student with a documented disability. If you have a need for accommodation in this course, please make an appointment to see me at your earliest convenience.

Safety:

Personal and equipment safety standards will be strictly enforced. It is the individual’s responsibility to develop a safe work attitude.

Calendar or schedule indicating course content:

Day 1: Types of antennas, ways to transmit, ways to receive and magnetic field. Use the five methods; peak, null, depth measurement, the peak method, and the null method for locating a specific underground utility line by measuring and determining the shape of its magnetic field.

Demonstrations: Ways to transmit, ways to receive, line magnetic field, peak and null measurements, depth measurement, peak method and null method to determine if the magnetic field is circular or non-circular. Methods for locating/tracking a utility line.

Lab: Using of receiver to get the peak reading, the null reading, the depth reading, and using the peak method, and the null method to determine the shape of the underground utility’s magnetic field.

Day 2: Review of day 1 material. Inductive and conductive methods of injecting a magnetic signal on a utility line. Use of frequencies for different types of utility location conditions. The five methods used to determine a circular magnetic field. Types of underground electrical cables and how they work. Five methods to change the signal strength and the signal shape. Types of utility pipes, insulated and non-insulated.

Demonstrations: Use of frequencies to increase or decrease current on a utility line. Five methods to determine if a utility line’s magnetic field is circular or non-circular. Five methods for changing signal strength on a utility line.

Lab: Determining if a utility line’s magnetic field is circular or non-circular. Using different frequencies on the same utility line to increase or decrease the current on the line. Determining the shape of an underground utility’s magnetic field.
Day 3: Certification standards: Five ways to change the current/signal strength on a utility line. Five ways to determine the shape of a utility line’s magnetic field. Five methods to change the shape of a utility line’s magnetic field. Induction vs. conduction on underground utility lines. Wyoming State Law on public utilities.

**Demonstration:** Changing the magnetic field’s shape on a utility line. Two-man sweep method of finding a utility line. Using induction to blank out one utility line to locate a nearby utility line.

**Lab:** Practice the two-man sweep method and blanking out a utility line using induction. Practice finding and tracking utility lines.

Day 4: Review of all material from day 1 to day 3. Written test.

**Lab:** Practice finding and tracking utility lines using the induction and conduction methods.

Day 5: Individual certification practical testing.