

ATLB-1020: MEASUREMENTS AND LEVELING

Cuyahoga Community College

Viewing: ATLB-1020 : Measurements and Leveling

Board of Trustees:

2012-06-28

Academic Term:

Spring 2019

Subject Code

ATLB - AIT-Construct/Hazard Material

Course Number:

1020

Title:

Measurements and Leveling

Catalog Description:

Construction measuring using rulers and tapes. Introduction to leveling and layout instruments. Elevation transfer and standard building layout procedures.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to the Construction Tending and Hazardous Material Abatement program.

Outcomes

Course Outcome(s):

1. Demonstrate proper measuring techniques and terminology using applied calculations and standard measuring tools.

Course Outcome(s):

2. Demonstrate the ability to use field leveling equipment using proper tools and terminology.

Course Outcome(s):

3. Operate the leveling equipment to establish and control field elevations.

Course Outcome(s):

4. Demonstrate the ability to establish perpendicular lines and various geometric angles and shapes using applied math and hand tools.

Methods of Evaluation:

1. Quizzes
2. Tests field assignments
3. Class participation

Course Content Outline:

1. Measuring techniques
 - a. Standard graduations
 - i. Feet
 - ii. Inches
 - iii. Fractional parts of an inch
 - b. Engineering graduations
 - i. Feet
 - ii. Tenths
 - iii. Hundredths
 - c. Conversions
 - i. Inches and fractional parts of an inch to decimal feet
 - ii. Decimal feet to fractional parts of an inch
 - d. Math concepts
 - i. Addition
 - ii. Subtraction
 - e. Terminology
 - i. Slope
 - ii. Percent of grade
 1. Field stationing
2. Field leveling equipment
 - a. Types
 - i. Tripod
 - ii. Rods
 - iii. Level
 1. standard
 2. auto
 - iv. Hub, stakes, pins
 - v. Rotating grade laser
 - b. Hand tools
 - i. Tape
 - ii. Plumb bob and reel
 - iii. Ruler
3. Equipment set-up
 - a. Location
 - b. Tripod
 - c. Level
 - d. Field book
4. Leveling rod
 - a. Pulley rod
 - b. Direct reading
 - c. Positioning
5. Terminology
 - a. Elevation transfer
 - b. Building layout
 - c. Elevation control
6. Grade transfer
 - a. Height of instrument
 - b. Back sight
 - c. Front sight
 - d. Elevation
7. Record keeping
 - a. Rod readings
 - b. Bench marks
 - c. Field sketch
 - d. Elevations
 - e. Verification
8. Grade elevations

- a. Sub grade
- b. Flow line
- c. Top of concrete
- d. Miscellaneous
- 9. Elevation transfer
 - a. Circuit closure
 - b. Math verification
- 10. Basic building layout
 - a. Hand tools
 - i. Tapes and rulers
 - ii. Plum bob
 - iii. Hammers
 - iv. Level
 - b. Pythagorean Theorem
 - i. Math concept
 - ii. Application
- 11. Geometric shapes
 - a. Perpendicular lines
 - b. Angles
 - c. Rectangles
- 12. Accuracy verification
 - a. Math
 - b. Field check with tools

Resources

LIUNA Training and Education Fund. *Construction Measuring Techniques and Elevation Control*. Pomfret Center, CN: LIUNA Training and Education Fund, 2008.

LIUNA Training and Education Fund. *Basic Construction Math*. Pomfret Center, CN: LIUNA Training and Education Fund, 2008.

Wesley G. Crawford. *Construction Surveying and Layout 1995*. 2nd ed. West Lafayette, IN: Creative Construction Publishing Co., 2008.

Resources Other

1. www.ehow.com/other-construction-measurements/ (<http://www.ehow.com/other-construction-measurements/>)
2. www.amazon.com/Elementary-Surveying.../0131481894
3. www.shutterstock.com/.../stock-photo-taking-measurements-at-construction-site.html -

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