ATCT-1370: LAYOUT

Cuyahoga Community College

Viewing: ATCT-1370 : Layout

Board of Trustees:
May 2024

Academic Term:
Fall 2024

Subject Code
ATCT - Appld Indus Tech - Carpentry

Course Number:
1370

Title:
Layout

Catalog Description:
Introduction to use of builder's level, level transit, and digital theodelite in the construction industry for establishment of elevations and grades and building layout. Course includes required math and geometry concepts and interpretation of site drawings and topographical plans generally used in the construction industry.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Departmental approval: admission to any Applied Industrial Technology program.

Outcomes

Course Outcome(s):
Interpret site drawings, civil drawings, and topographical plans for pertinent information.

Objective(s):
1. Recognize symbols used on site drawings, civil drawings, and topographical plans.
2. Identify elevation benchmarks and contour lines on topographical plans to determine grade.

Course Outcome(s):
Locate building hubs, layout angles, establish level planes, and set up building layout.

Objective(s):
1. Set up layout equipment.
2. Locate building hubs at 90 degree corners and install batter boards.
3. Layout angles greater than or less than 90 degrees which are accurate to within tolerance of the equipment i.e. +/- 5 minutes.
4. Establish level planes of reference from monuments and benchmarks.
5. Interpret site drawings.
6. Apply math functions requiring engineering conversions, angular measure, and Pythagorean theorem.
7. Transfer planes of reference from monuments and benchmarks.

Course Outcome(s):
Use a builder's level and level transit to establish elevation and grades for building set up.

Objective(s):
1. Differentiate between builder's level and level transit and identify appropriate uses for each.
2. Demonstrate correct use of a builder's level and level transit.

Methods of Evaluation:
1. Quizzes
2. Exams
3. Classroom participation
4. Completion of assigned projects

Course Content Outline:
1. Concepts
   a. Component identification of layout equipment.
   b. Reading engineering rod and architectural rod
   c. Pythagorean theorem
   d. Engineering conversions
   e. Angular measurements
   f. Topographic plan symbols and abbreviations
   g. Site plan symbols and abbreviations
   h. Civil drawing symbols and abbreviations
   i. Leveling procedure
   j. Vernier scale
   k. Lines of Stadia and stadia measurement
   l. Charting techniques
   m. Field note taking techniques
2. Skills
   a. Setting up building layout equipment.
   b. Levelling and plumbing instrument over hubs and reference points using optical plummet or plumb bob.
   c. Locating hubs at 90-degree corners with setbacks and offset stakes.
   d. Laying out angles different than 90 degrees using the Vernier scale and adjustments with tangent screws and crosshair.
   e. Transferring level planes of reference from monuments and benchmarks using differential leveling techniques.
   f. Using charting and field note-taking skills.
   g. Establishing grade on civil site plan.
   h. Interpreting site drawings from topographic maps, site plans, and civil drawings.
   i. Calculating engineering conversions, angular measures, and Pythagorean Theorem.
   j. Determining distance using lines of stadia.
3. Issues
   a. Site conditions
   b. Weather-related issues
   c. Traffic
   d. Power line

Resources
Koel, Leonard. *Carpentry*. 7th ed. Homewood: American Technical Publishers, 2021.

Washington, Allyn, Richard Evans. *Basic Technical Mathematics*. 11th edition. Pearson, 2019.

Carpenters International Training Fund. *Building Layout.* Las Vegas: Carpenters International Training Fund, 2005.

Leveling and Layout Instruments. Las Vegas, NV: Carpenters International Training Fund, 2016.

Resources Other

Carpenter's International Training Fund. https://www.carpenters.org/citf-training/ . 2024.

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