

CIV 210 – Land Surveying

Current Catalog Description: Introduces the general mathematical and physical concepts related to engineering surveying. Covers plane surveying, geodesy, geodetics, measurement techniques and instruments, leveling, error theory, survey adjustments, coordinate systems and datums. Practical measurement techniques and instruments, and survey staking. Introduces photogrammetry and remote sensing, geographic information systems (GIS).

Prerequisite: PHV127 or 132; MAT 127 or 132 or 142 or AMS 161; CIV Major

Corequisite: None

Textbooks and/or Other Required Material: Required Texts:
 Surveying Fundamentals and Practices- Pearson 7th Edition, Surveyor's field note book (Elan Publishing Company E64-8x4W Wire-O Field, Surveying Book, stiff yellow cover available from Amazon) Field Book Allen, Precision APE #115300 or Forestry Suppliers #FB842, or equivalent.

1. NCEES Approved Scientific Calculator
2. Basic drafting equipment such as a straight edge., protractor, Timely Template and a drafting pencil.

This course is: Required

Topics Covered: Field Measurement
 Differential Leveling
 Profiles Leveling
 Grid Leveling & Contour Mapping
 Traverse Methods
 Coordinate Geometry, Traverse Closure, Traverse Adjustment
 Total Station use in Topographic Survey
 Survey Study Area
 Learning to create a Site Plan from Topographic Survey Data

Course Learning and Student Outcomes:

Course Learning Objectives	<u>ABET Student Outcomes</u>
Ability to measure distances with a steel tape, correctly measure to account for slope, tension, temperature and non-standard length.	5,6,7
Ability to apply the technique of differential leveling to run a closed loop bench and close within acceptable limits.	5,6,7
Obtain pipe route profile data using a level and record elevations in a field notebook. Plot elevations and data, and label on graph paper.	5,6,7
Obtain elevation data on a grid, plot points, plot cross-sections and calculate volume via average end area method.	1,5,6,7

Using points from cross sections, plot spot elevations and draw a one foot interval contour map	1,2,5,6,7
Ability to use an electronic total station to measure angles and distances and record data in fieldbook for later processing. Calculate closure.	1,2,5,6,7
Ability to adjust traverse coordinates in an assumed coordinate system to obtain adjusted coordinates and acceptable traverse closure	1,6,7
Ability to accurately plot all data onto a map depicting the study area.	2,6,7

Prepared by: Frank Flanagan (2020)