

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: CIVL 310 Department: Civil Engineering Technology

Course Title: Surveying 1 Semester: Spring Year: 1999

Architectural CAD I Objectives/Competencies

Course Objective	Competencies
<p>1. To develop a working knowledge of the care and operation of the basic surveying instruments common to the surveying profession and the construction site – in particular, the cloth tape, the steel tape, the level and the transit.</p>	<ol style="list-style-type: none">1. Learn how to consistently measure distances by pacing with a +/- accuracy of 1 ft.2. Measure distances to the nearest 1/10th foot using the cloth tape.3. Measure distances to the nearest 1/100th foot using the steel tape with an accuracy of +/- 0.02 ft.4. Measure distances over uneven ground showing how to “break tape” with proper use of plumb bob alignment.5. Set up tripod and mount instruments on them.6. Set up level and take rod readings to determine differences in elevation, profile, cross section and contour elevations.7. Move from one location with a referenced bench mark to new locations utilizing proper foresights, turning points and back sights.8. Set up transit and determine horizontal angles, vertical angles and magnetic bearings. Use transit to complete a closed traverse.

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<p>2. To develop a working knowledge of the care and operation of a total station and data collector.</p> <p>3. To instill in the student's mind the necessity to maintain and develop neat, legible, accurate field books, maps and drawings from field observations and instrument readings.</p> <p>4. To give students the training and experience to prepare surveying drawings from recorded field data.</p>	<p>9. Demonstrate how to take stadia measurements in the field and reduce them to correct object location and elevation.</p> <p>1. Set up total station, "wake up" instrument, and orient the instrument with proper height of instrument, elevation of instrument, and atmospheric conditions.</p> <p>2. Measure slope distances, horizontal distances, vertical angles and horizontal angles at various locations of the prism pole.</p> <p>3. Resection utilizing given elevations and traverse points.</p> <p>4. Record the locations of key topographic features including roadways, light poles, manholes, trees and buildings.</p> <p>5. Download survey data from data collectors to computer and plot the data and field information.</p> <p>1. Record survey field data in a field book showing index, date, weather, crew assignments, instruments used, sketches of land area surveyed and instrument data for each lab.</p> <p>2. Develop neat, hand drawn sketches of the land areas surveyed.</p> <p>3. Show closure checks for different leveling, cross sections, profiles, contours, and traverses. Correct bench mark elevations to provide closure.</p>

Course Objective	Competencies
<p>5. To learn the normal steel tape corrections for accurate calculations of horizontal distances.</p> <p>6. To learn how to develop and draw contour lines.</p> <p>7. To learn the concepts of annual declination and local attraction.</p> <p>8. To learn how to measure and calculate land areas through the use of latitudes, departures and coordinates and then verify these land area calculations with computer applications of surveying software.</p> <p>9. To learn how to calculate earth volumes utilizing the average and method.</p>	<ol style="list-style-type: none"> 1. Prepare a tape survey map utilizing only steel and cloth tapes. 2. Prepare a fully detailed topographic map of a major section of the STCC campus. <ol style="list-style-type: none"> 1. Make steel corrections for tape length, temperature, slope, sag, pull and alignment. <ol style="list-style-type: none"> 1. Prepare calculations to determine lines of equal elevation for given sections of land. 2. Draw contour lines on topographic maps showing lines of equal elevation of these land areas. <ol style="list-style-type: none"> 1. Make corrections to find current magnetic bearings based on old bearings and the reported declination. 2. Make corrections to local attraction variances with magnetic bearings to determine accurate forward and back bearings. <ol style="list-style-type: none"> 1. Calculate the acreage of land areas, showing the accuracy and the precision of the survey data. 2. Verify acreage by utilization of survey software applications. <ol style="list-style-type: none"> 1. Calculate cross section areas from cross section survey data. 2. Calculate earth volumes from cross section survey data, showing the difference between cuts and fills.

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10. To learn how to stake out the corners of a building lot and locate a proposed building on the site.	<ol style="list-style-type: none">1. Utilizing a plot plan with set back data from the street, locate and stake property corners and proposed building corners.2. Check diagonal lengths to verify “square” of the building.3. Use cloth tape to verify the correct location of the stakes.