South Central College

CTLS 1815 Surveying 2

Course Outcome Summary

Course Information

Description This course covers the practices and techniques required in topographic, route, control, and construction surveys. It will also stress highway curves, cross-sections, and layout. The course will focus on the use, care, and maintenance of TopCon total stations and Trimble GPS. (Prerequisites: CTLS 1810)

Total Credits 4

Total Hours 96

Types of Instruction

Instruction Type	Credits/Hours
Lecture	2
Lab	2

Pre/Corequisites

CTLS 1810

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Examine the total station.

Learning Objectives

Summarize total station characteristics.
Demonstrate proper total station setup.
Demonstrate proper equipment care procedures.

2. Operate the integrated controller software.

Learning Objectives

Identify input data.
Analyze output data.
Create proper codes and line types.
Collect survey data.

Import/export data.

3. Survey with Trimble Survey Controller and TOPCON TopSURV software.

Learning Objectives

Perform backsight setup.
Perform angle/distance sets.
Utilize resection.

4. Use the STAKE OUT function.

Learning Objectives

Use the stakeout points, point in direction and point list.
Use the stakeout line and line & offsets.

5. Use COGO function.

Learning Objectives

Create points using the inverse function.
Create points using the point in direction function.
Create points using the traverse function.
Create points using the curve solutions function.
Calculate areas.

6. Create a topographic survey (capstone project).

Learning Objectives

Utilize total station and GPS to collect data.
Survey topographic features.
Create code list.
Prepare detailed log book entries.
Download and backup digital files.

7. Create cross sections and profiles.

Learning Objectives

Draw cross sections.
Draw profiles.
Calculate and define end area, cut, and fill.
Summarize cross section and profile characteristics.

8. Analyze construction volumes.

Learning Objectives

Balance cut and fill.
Compute volumes based on Trapezoidal technique.
Compute volumes based on Simpson's one-third rule.
Explore material shrinkage and swelling.

9. Evaluate control surveys.

Learning Objectives

Explore geodetic surveys.
Adjust traverses using latitude and departures.
Adjust angles and final lengths of a triangulation network.
Calculate error of closure and accuracy.
Acknowledge various grid systems.
Explore control survey markers.

10. Explain safety issues for surveyors.

Learning Objectives

Summarize traffic safety requirements for surveyors.
Explain right-to-enter and trespassing for surveyors.
Use proper personal protective equipment.
Demonstrate safe work habits.

11. Examine highway curves.

Learning Objectives
Summarize curve characteristics.
Compute circle curves.
Compute vertical curves.
Summarize the use of spiral curve.
Summarize the use of superelevated curves.
Explain field procedures for laying out curves.

12. Examine construction surveys.

Learning Objectives
Calculate setting grade marks.
Compute cuts and fills.
Determine placement of slope stakes.
Describe various methods of staking out a building.
Prepare line and grade for a sewer.

13. Summarize the global positioning system.

Learning Objectives
Summarize required equipment.
Identify static surveys.
Identify kinematic surveys.

14. Operate Trimble GPS equipment.

Learning Objectives
Setup Trimble GPS base station and rover.
Setup Trimble VRS GPS.
Connect to base using radio links or data cards.
Perform topographic and control survey using GPS.

15. Examine topographic surveys and maps.

Learning Objectives
Describe the general rules for contours.
Determine map scales and relative factors.
Interpolate between contours.
Measure slope from contours.
Draw topographic maps.
Summarize topographic symbols and lettering.

16. Examine property surveys.

Learning Objectives
Describe the framework of the U.S. Public Lands Survey System.
Describe property in the cadastral system.
Summarize ROW, easements, and adverse possession.
Sketch a plat from a metes and bound description.

SCC Accessibility Statement

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