South Central College

CTLS 1810 Introduction to Surveying

Course Outcome Summary

Course Information

Description This course covers the principles of plane surveying involving methods of measuring horizontal and vertical distance, elevation and angles. Practice in the use of common measurement equipment, leveling instruments, compass, transit, theodolite and total station is stressed along with introduction to Global Positioning Systems and proper care and maintenance of all equipment. Recording of field information and correction of acquired data are an important part of this course. (Prerequisite: Successful completion of MATH 0075 with a grade of C or above, or an Accuplacer Arithmetic score of 56 or above.)

Total Credits 4

Total Hours 96

Types of Instruction

Instruction Type	Credits/Hours
Lecture	2
Lab	2

Pre/Corequisites

Successful completion of MATH 0075 with a grade of C or above, or an Accuplacer Arithmetic score of 56 or above.

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. Summarize the principles of surveying.

Learning Objectives
Describe the history of surveying.
Define plane and geodetic surveying.
Define classes of surveys.

2. Analyze the units of measurement for surveying.

Learning Objectives
Convert and calculate units of measurement.
Compute significant figures.
Define stationing.
Perform measuring by pacing.
Identify stadia measurements.

3. Demonstrate proper recording of field notes.

Learning Objectives
Define field notes and their use.
Write field notes in proper form.
Organize and arrange notes.

4. Identify errors encountered by surveying.

Learning Objectives
Define precision and accuracy.
Explain systematic and random errors.
Minimize errors through proper techniques and corrections.

5. Demonstrate taping techniques.

Learning Objectives
Perform level and uneven ground taping.
Demonstrate taping equipment care and proper use.
Determine taping errors, mistakes, and corrections.
Perform slope measurements.

6. Examine levels and level rods.

Learning Objectives
Identify various types of levels and level rods.
Demonstrate reading and proper placement of level rods.
Demonstrate proper setup, use, and care of levels and level rods.
Identify elevation datums.

7. Illustrate leveling techniques.

Learning Objectives
Perform benchmark leveling.
Perform profile and cross section leveling.
Perform reciprocal leveling.
Analyze leveling mistakes.

8. Analyze angles and directions.

Learning Objectives
Compute vertical angles referenced to meridians.
Identify horizontal angles and directions.
Compute angles, azimuths, and bearings.

9. Examine various types of distance measuring instruments.

Learning Objectives
Summarize a transits properties.
Summarize a theodolites properties.
Summarize a total stations properties.
Summarize a GPSs properties.

10. Illustrate total station setup and operational procedures.

Learning Objectives
Demonstrate tripod setup and equipment care procedures.
Demonstrate leveling and centering the instrument.
Identify input data and total station calibration.

Analyze total station output data.

11. Investigate magnetic declination and the compass.

Learning Objectives

Describe the true meridian.
Identify magnetic declination.
Compute adjustments for declination.

12. Identify Minnesota tree types.

Learning Objectives

Identify deciduous trees.
Identify conifer trees.
Identify tree caliper.

SCC Accessibility Statement

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Additional information and forms can be found at: www.southcentral.edu/disability

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