South Central College

CTLS 1810  Introduction to Surveying

Common Course Outline

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 and current enrollment in MATH 0085 or above.)

Total Credits  4.00
Total Hours  104.00

Types of Instruction

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<th>Instruction Type</th>
<th>Credits/Hours</th>
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<tbody>
<tr>
<td>Lecture</td>
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<td>Lab</td>
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Pre/Corequisites

Prerequisite  Successful completion of MATH 0075 with a grade of C or above and current enrollment in MATH 0085 or above.

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  Value recording of field notes.
Learning Objectives
Define field notes and its uses.
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

If you have a disability and need accommodations to participate in the course activities, please contact your instructor as soon as possible. This information will be made available in an alternative format, such as Braille, large print, or cassette tape, upon request. If you wish to contact the college ADA Coordinator, call that office at 507-389-7222.

Disabilities page http://southcentral.edu/academic-policies/disability-rights.html