SURV 101
Surveying Instruments

3 Credits (2 Lecture hours and 3 Laboratory hours per week)

Community College of Baltimore County
Common Course Outline

Description

SURV 101 – Surveying Instruments: Introduces the instruments of surveying and their uses in the art of determining the relative positions of points and lines on the earth's surface. Covers procedures for keeping proper field notes; causes of errors and mistakes in measurements; methods of determining accurate linear measurements; and procedures for determining distances and elevations by direct and indirect methods; examines proper use of the transit, theodolite, compass, electronic total station, engineer's level, auto compensating level, alidade, scientific calculator, and global positioning systems. Credit by exam available.

Co-requisites: SURV 111

Overall Course Objectives

Upon completion of this course, students will be able to:

1. Use a scientific calculator to perform data conversions and basic calculations with 90% accuracy;
2. Measure a horizontal distance by pacing, stadia, taping, total station, and global positioning systems (GPS) to industry standards of accuracy;
3. Set-up elevation determining instruments, read a leveling rode, and complete a level run to industry standards of accuracy;
4. Set-up direction determining instruments, set up directional targets and measure horizontal and vertical directions to industry standards of accuracy;
5. Install a surveying monument to industry standards of accuracy;
6. Use a surveyor's compass to determine a magnetic direction and correct that measurement for local magnetic declination to determine a true direction to industry standards of accuracy;
7. Conduct a traverse with the appropriate surveying instruments to industry standards of accuracy;
8. Stakeout a horizontal survey using appropriate surveying instruments to industry standards of accuracy;
9. Stakeout a building location using appropriate surveying instruments to industry standards of accuracy;
10. Use GPS equipment to establish point positions (static observation) to industry standards of accuracy;
11. Apply knowledge about basic land, construction, and property surveying concepts and techniques to answer questions on tests with a minimum 60% accuracy; and
12. Apply knowledge about industry standards to answer questions on tests with a minimum 60% accuracy.

Major Topics

I. Scientific Calculator
   a. Algebraic/RPN Function
   b. Key Functions
   c. Entering Formulas and Data Conversions
II. Distance Measurement
   a. Principles and Procedures
   b. Equipment
III. Elevation Measurement
   a. Principles and Procedures
   b. Equipment
IV. Direction Measurements
   a. Principles and Procedures
   b. Equipment
V. GPS
   a. Principles and Procedures
   b. Equipment
VI. Stake Out
   a. Principles and Procedures
   b. Equipment
VII. Basic Land, Construction, and Property Surveying Concepts and Techniques
VIII. Industry Specifications and Standards of Accuracy

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Quizzes, tests, exams: Individual instructors will notify students of procedures, but as a minimum two test or quizzes will be required
- Comprehensive Midterm Exam: The course will require a comprehensive Midterm Exam
- Comprehensive Final Exam: The course will require a comprehensive final exam
- Fieldwork and Exercises: Individual instructors will notify students of procedures, but as a minimum, students will be graded upon participation and accuracy

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

This course is a core course in Surveying Degree and Certificate Programs.

This course is taught in a classroom environment.

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