C-ID Descriptor
Surveying

Descriptor Details

- **Descriptor Title**: Surveying
- **C-ID Number**: 180
- **Units**: 3
- **Date of Last Revision**: 10/12/2017 11:44:08 PM GMT+0000

General Description

The course applies theory and principles of plane surveying: office computations and design; operation of surveying field equipment; and production of engineering plans/maps. Topics include distances, angles, and directions; differential leveling; traversing; property/boundary surveys; topographic surveys/mapping; volume/earthwork; horizontal and vertical curves; land description techniques; and GPS. Extensive field work using tapes, levels, transits, theodolites, total stations, and GPS.

Prerequisites

High School or College Trigonometry (C-ID MATH 851) or Precalculus (C-ID MATH 155)

Corequisites

None

Advisories

None

Content

1. Field Book
2. Distance Measurements
3. Differential Leveling
4. Angles and Directions; Compass
5. Traversing: Coordinates, Latitude/Departure, Land Area Calculation
6. Coordinate Geometry
7. Error Analysis
8. Property/Boundary Surveys; Metes and Bounds Descriptions
9. Topographic Surveys and Mapping
10. Volume/Earthwork
11. Horizontal and Vertical Curves
12. Issues in Professional Practice; PE and LS Licensing
13. Introduction to GPS
14. Manual and Computer-Aided Drafting of Plans
15. Equipment: Tapes; Levels; Transits; Theodolites; Total Stations, GPS
16. Introduction to Photogrammetry Theory/Viewing Aerial Photos (optional)
17. Stadia Theory (optional)
18. Introduction to GIS (optional)
19. Construction Applications (optional)

Lab Activities

1. Field Book
2. Distance Measurements
3. Differential Leveling
4. Angles and Directions
5. Error Analysis
6. Topographic Surveys and Mapping
7. Horizontal Curves
8. GPS
9. Manual and Computer-Aided Drafting of Plans
10. Equipment: Tapes; Levels; Transits; Theodolites; Total Stations, GPS

Objectives

Upon successful completion of the course, students will be able to:

1. Perform office computations and design for differential leveling; traversing; area calculations; property/boundary surveys; topographic surveys/mapping; volume/earthwork; horizontal and vertical curves; and error analysis.
2. Operate survey equipment: tape, level, transit, theodolite, compass, total station, GPS.
3. Reduce field notes using various mathematical techniques to generate meaningful records describing horizontal and vertical control of landforms.
4. Plot plans and maps from field work data using manual and computer-aided drafting.
5. Work effectively in groups during field surveying and engineering design project which involve problem solving, report writing, and oral presentations.

Evaluation Methods

Tests, examinations, homework, field work and field books, quizzes, projects, CAD-generated plans, and reading technical articles and writing technical reports where students demonstrate their mastery of the learning objectives and their ability to devise, organize and present complete solutions to problems.

Textbooks

Kavanagh, Barry, Surveying: Principles and Application

McCormac, Jack, Surveying

Wolf, Paul et al, Elementary Surveying: An Introduction to Geomatics