



CE 221 – Engineering Surveying

Code and Name: CE 221 – Engineering Surveying

Credit Hours: 3 (Lecture: 2, Tutorial: 1, Laboratory: 2)

Textbook:

- Elementary Surveying: An introduction to Geomatics: Paul Wolf, Charles Ghilani, Thirteenth Edition, Pearson, 2011

Other References:

- *Surveying problem solving with theory and objective type questions*, by Dr A M Chandra,
- *Survey computations* by Bruce R. Harvey,
- *General Commission for Survey*, www.gcs.gov.sa
- *Course handouts: distributed on a regular basis to provide more information on the topic.*

Course Description:

Introduction to surveying and photogrammetry. Horizontal and vertical distance measurement, angles and direction, traverses, errors and their adjustments, control and construction surveys; coordinate geometry; area computations; topographic maps; introduction to horizontal and vertical curves; Lab and field practice with modern surveying equipment.

Pre-requisites: GE 103 Engineering Graphics Design, CS 107 Computer programming

Co-requisites: None

Course Learning Outcomes:

With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)

1. Identify the principles and techniques used in engineering surveying (1)
2. Carry out the calculations related to the acquired field data (1)
3. Compute the errors in collected field data and how to adjust for these errors (1)
4. Draw and interpret sketches, contour maps and profiles (1)
5. Use various surveying equipment for data acquisition, organize the field data and write reports (6)
6. Function as a team in field environment (5)

Topics to be covered:

- Introduction to surveying. Reviewing: mathematical formulas.
- Basics of surveying.
- Linear measurements.
- Differential leveling.
- Angle measurements.
- Traverse Surveying (coordinates and area calculations).
- Horizontal and vertical curves.
- Introduction to GPS, GIS and remote sensing.
- Practical Part (field measurements and related calculations and sketching: discovery of surveying equipment, data collection and errors, set up of theodolite, horizontal angles measurements, differential leveling, inaccessible point measurements, Traverse survey with total station, stake out with total station, use of planimeter, use of GPS receiver in land surveying).

Grading Policy:

The grading for the course are 60% coursework and 40% Final Exam. The course work consists of 30% Theory Part (1stMidterm:15%, 2ndMidterm:10% and Quizzes:5%) and 30% Laboratory Part (Lab Reports:10%, Quizzes:5%, Oral Exam:3% and Final Lab Exam 12%).

