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**AGEN 135**  
**Construction Surveying**  
**Fall 2009**

Third Examination Study Guide

Prepared By

[Dr. Walid H. Shayya](#)

- Understand how to use trigonometric functions whenever needed.
- Define trigonometric leveling and when it is used.
- Understand the steps involved in trigonometric leveling.
- Understand stadia principles and how to make distance measurements using stadia lines, both with a level or inclined telescope.
- Know the terms  $h_i$ ,  $H_I$ ,  $RR$ , and rod interval ( $RI = TW - BW$ ) as well as how they are used in stadia measurements.
- Know how to solve problems involving stadia measurements and trigonometric leveling.
- Define GPS and know what does it stand for.
- Know the three segments of GPS and how these segments function.
- How does a GPS receiver determine its position?
- What is the key to measuring distances from satellites using GPS?
- Understand how can GPS be applied in surveying.
- Understand the use of EDM and total stations.
- Understand the difference among electronic theodolites and total stations.
- Understand the use of EDM instruments with reflectorless technology.
- Understand how to work with map (plan) scale and its applications in location and layout surveys.
- Understand what is unique about topographic maps and how to interpret them.
- Know what contour lines correspond to and how these provide an idea of topography.
- Understand how to read contour lines.
- Find horizontal angles when given a list of data from a repeating theodolite.
- Know how to work with vertical angles and how they are referenced in transits, theodolites, and total stations (horizontal, zenith, nadir).
- Know how to work with closed and open traverses.
- Understand the methods for measuring angles or directions in traverse surveys.
- Know why, when, and how deflection angles are measured.
- Know and be able to use formulas for the sum of interior angles [i.e.,  $(n-2) \cdot 180^\circ$ ].
- Define the difference between true and magnetic north.
- Understand magnetic declination and how it changes.
- Establish a direction of a line if given a bearing.
- Establish a direction of a line if given an azimuth.
- Convert among bearings, reverse bearings, azimuths, and reverse azimuths.
- Compute the bearings and/or azimuths for lines in a traverse (open or closed) given pertinent angles and distances of the lines and the direction of one of the lines.
- Understand how to adjust interior angles for an open traverse.

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