
NATR 142
Plane Surveying
Fall 2009

Second Examination Study Guide

Prepared By

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- Know and be able to use formulas on grade (slope) and % grade
- Define the terms vertical line, horizontal plane, datum, mean sea level, horizontal line, and elevation.
- List and discuss the three leveling methods covered (or outlined) in the class.
- List different leveling equipment and understand the difference between the dumpy, automatic, and laser levels.
- Define differential leveling and why it may be used.
- Understand the terms instrument set, BM, TBM, TP, BS, HI, FS, IS, note reductions, balancing of sights, closed circuit, closure error, and page check as well as when each is used in the development of proper surveying notes.
- Understand the steps involved in differential leveling.
- List some of the common mistakes that can lead to errors when performing differential leveling.
- Set up and calculate a proper set of field notes for differential leveling, and perform page check and closure.
- Define profile and cross-section leveling.
- Describe ground measurements taken in profile and cross-section leveling.
- Set up and calculate a proper set of field notes for profile leveling and profile cross-section leveling (including the two formats for field notes in cross-section leveling).
- Understand how to minimize measurement errors in profile and cross-section leveling.
- Understand the difference between transits and theodolites and their applications.
- List why setting up a theodolite is usually more involved than a dumpy or a laser level.
- Understand the differences between directional and repeating optical theodolites and the advantages and disadvantages of each.
- Find horizontal angles when given a list of data from a repeating theodolite.
- Calculate an angle when given the first and second readings of a directional theodolite.
- Discuss vertical angles and how they are referenced in transits and theodolites (horizontal, zenith, nadir).
- Know and be able to use formulas for the sum of interior angles [i.e., $(n-2)*180^\circ$].
- Be able to know why, when, and how deflection angles are measured.
- Understand how to lay off angles using a theodolite and what is meant by interlining (balancing in) and its application.
- Understand when you need to and how to prolong a straight line by double centering, triangulation techniques, and right angle offset.