Chapter 2 Units, Significant Figures and Field Notes
Part 1 Units and significant figures

2-1 Introduction
Five kinds of measurements broken into two categories, angular and distance.
1. Horizontal angles
2. Vertical or Zenith Angles
3. Horizontal distance
4. Slope distance
5. Vertical distance

2-2 Units of measurement
Most commonly employed units are for length, area, volume and angle (direction).

Two different systems used: English and Metric. Only three countries use the English system and England isn't one of them: US, Liberia and Burma. Every one else uses the metric or system international.

English distance
Inch (12 inches to one foot)
Foot (standard measurement, decimal feet)
Yard (3 feet)
Rod, perch, or pole (16.5 feet)
Chain (66 feet, 100 links or 4 rods)
Vara (33 inches)
Mile (5280 feet, 80 chains, 1760 yards)

English Areas and Volumes
Area = square feet or acres (43560 sf)
Volume = cubic feet, yards, acre-ft

English Angle
Degrees, Minutes and Seconds, 360 degrees in a circle
60 seconds = 1 minute
60 minutes = 1 degree
Mils: 6400 units per circle

2-3 Metric Units
Metric distance
Meter (39.37 inches)
Milli, centi, kilometer

Meter Areas and Volumes
Area = square meters or hectares (10000 sm)
Volume = cubic meters

Metric Angle
Grads or Gons: 400 units per circle
Metric minutes 100 per Grad
Metric Seconds 100 per metric minute

2-4 Significant figures
In recording observations, an indication of the accuracy attained is the number of digits (significant figures) recorded. By definition, the number of SF in any observation includes the positive (certain) digits plus one digit that is estimated or rounded off and therefore questionable.
For instance, a distance measured with a steel tape that is graduated in 0.01' measures a distance of 73.52'. This observation has four SF, the first three plus the last one that is rounded off.

Any properly recorded measurement can be presumed to have a maximum uncertainty of one-half the last digit read.

2-5 Rounding off numbers

When the digit to be dropped is less than 5 leave the rounded number as is. 78.374 is 78.37…just as 78.3749 rounded off to four SF is still 78.37

When the digit to be dropped is greater than 5 increase the rounded off number by one. 78.376 is 78.38.

When the digit to be dropped is exactly 5, the nearest even number is used for the rounded off value. 78.375 becomes 78.38. 78.385 becomes 78.38 also. 78.365 becomes 78.36.

Part II Field Notes
2-6 Field notes
Recorded information from all measurements and observations made in the field. May be in the form of hand written notes or electronic format. All field notes become part and parcel of the entire survey including the products produced from them.

Courts of law may subpoena field notes during a dispute in surveys between two surveyors. They are the historical reference for surveys past present and future.

2-7 Handwritten Field Notes
Accuracy
Integrity
Legibility
Arrangement
Clarity

2-8 Types of Field Books
Hard bound or loose leaf

2-9 Kinds of Notes
Sketches, Tabulations, Descriptions, Observations, and Testimony

When in doubt of whether or not you need the information in the notes, put it in!

2-10 Arrangement of Notes
See Lab syllabus for examples and directions
2-11 Suggestions for note keeping
See 25 examples in text.

2-12 Introduction to Automatic data Collectors
Electronic Field Book…will be covered at a later date

2-13 Transferring data from collector to PC
Will be covered later

2-14 Digital Data File Management
Will be covered later

2-15 Advantages and disadvantages of Automated Data collectors
Time, power, diagrams, weather, etc.