FE 208 Midterm 1 Review

**Measurement Error**

1. Define *Direct* and *Indirect* measurements
2. Define *Errors* and *Mistakes* in measurements
3. Be able to write the equation for errors
4. Know the four rules for all measurements
5. Know the four error sources
6. Know the two error types
7. Be able to calculate the adjustment for systematic errors
8. Define *Accuracy*, *Precision*, and *Bias*

**Statistics**

1. Understand the differences between standard deviation and standard error
2. Understand the main limits on the standard deviation and standard error curves, for example, the 68% and 95% limits
3. Given a data set, be able to discuss how the standard deviation and standard error reflect the data set
4. Understand the effects of sample size on the confidence of the statistical estimates
5. Understand why repeated measures are necessary for statistical inference
6. Recognize and use the equations for statistical inference, (mean, standard deviation, standard error, standard error in percent)
7. Review the FE 308 statistics problem handout

**Fundamentals of Survey Measurements**

1. Have a basic understanding of survey units
2. Know and be able to convert survey units to chains
3. Be able to work with correct significant figures
4. Know the four dimensions of survey measurements
5. Know the basic trigonometric relationships
6. Know the angle signs for the quadrants
7. Know the conversions for degree angles to radian angles
8. Know the conversion for slope percent to slope degree angle
**Horizontal Measurements**

1. Understand the differences between slope distance and horizontal distance
2. Calculate horizontal distance from slope distance
3. Calculate slope angle from horizontal distance and slope distance
4. Calculate vertical distance from slope distance and slope angle
5. Recognize and use the equations for horizontal and vertical distance
6. Recognize and work with proper field note form
7. Compute departures and latitudes from field notes
8. Compute coordinates from point to point from field notes
9. Compute interior angles from a set of field notes
10. Understand the purpose of reference points (RP's)

**Compass Theory**

1. Know the three main types of compasses foresters might use
2. Know the differences and accuracies of the three compass types
3. Be able to explain compass theory
4. Be able to explain the magnetic poles
5. Know the key points about the magnetic poles
6. Be able to explain magnetic declination
7. Know the main sources of variation in declination
8. Be able to explain local attraction
9. Know the procedure to recognize and correct for local attraction
10. Be able to do the three types of conversion problems

**Traverses**

1. Know the main types of traverses
2. Know the advantages and disadvantages for each type of traverse
3. Know the different ways to measure traverse angles
4. Know the procedures for referencing stations
5. Know how to write the survey reference stake
6. Know how to calculate angular mis-closure for a closed traverse
7. Know the duties/responsibilities for each survey traverse field position
Traverse Computations and Adjustments

1. Know the process for traverse computations and adjustment
2. Know the computations for departure and latitude
3. Know the quadrant signs for departure and latitude
4. Be able to compute coordinates from unadjusted departures and latitudes
5. Be able to compute traverse closure
6. Be able to compute linear error
7. Be able to compute relative error
8. Be able to compute relative error on an equivalent scale basis
9. Know the 4 methods of adjusting traverses
10. Be able to adjust traverses by the compass rule
11. Be able to compute latitude and departure corrections
12. Be able to compute adjusted latitude and departure
13. Be able to compute adjusted coordinates