

**FOR 373: Assignment 2 – Simple Random Sampling [60 points]**

Notes: 2-pages of notes can be attached to this assignment and you are encouraged to use your calculator or Excel where necessary. You must show your work to receive any credit (e.g., the equation you use and any assumptions you make). Doing so also indicates whether you understand the method and help you receive partial credit, even if your final answer is incorrect.

1. What is a simple random sample and what does it mean about the relationship between samples?
2. What are the two types of simple random sampling and what is the difference between them?
3. Give a benefit and cost of both circular and square plots.
4. What are the three requirements of a sampling design?
5. What are the measures of central tendency covered in class, provide a definition or equation for each.

6. Complete the calculation for volume per acre in plot #6, assuming trees are perfect cylinders and that plots are 1/10 acre in area. The use of Excel is encouraged.

Plot # 6 Data -

Tree	DBH (in)	Height (ft)	Volume (cu ft)
1	16	65	90.8
2	18	75	
3	15	60	
4	19	85	
5	15	60	
6	16	70	

Plot	Volume per acre (cu ft)
1	4285
2	7108
3	6650
4	4782
5	5185
6	

7. Provide the following statistics for the Preliminary Stand Exam Data for plot #6:
- Quadratic Mean Diameter
  - Trees per acre
  - Basal Area per Acre
8. Calculate the mean volume per acre, variance, coefficient of variation, and standard error for the 6 plots in question #6.
9. Using what you calculated in question #8, determine how many plots you would need in order to estimate the mean volume per acre in the stand to within 8% at a 95% confidence level. Assume the Stand is infinitely large.

10. Using what you calculated in #8, determine how many plots you would need in order to estimate the mean volume per acre within the stand to within 250 cu ft at a 95% confidence level. The stand is 80 acres.
11. What would be the new variance if we change the plot size in question #6 from 1/10 acre to 1/20 acre?
12. You have a 120 acre stand that you put 20 1/10 acre plots on. From the plots you calculate a mean Vol/Acre of 500 cu ft and a SD of 92 cu ft/Acre. If you sell the stand for \$300 mbf, with 90% certainty what would be the maximum value you could receive?
13. What assumption is necessary to use the statistics for sampling with replacement?

**Extra Credit:** Explain in your own words what the author of “Production in Forest Inventory – What is it?” argues is a good measure of “production”. There is no set length, but you must support your argument with at least two reasons. Grammar and writing clarity will be considered in grading; typing your thoughts in a word processor is encouraged. (10 points)