Syllabus for Statistics 6287, Modern Theory of Sample Surveys  
Michael D. Larsen, The George Washington University  
Class meets 6:10pm – 8:40pm, Funger 209, Spring of 2015  
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Sharon Lohr’s book (Lohr)  
Lumley’s book (TL)  
SAS: http://itl.gwu.edu/itl_sas.html  
R: http://www.r-project.org/ (download)

1. Monday, January 12, 2015  
a. Introduction to Statistics 6287  
b. Introduction to sample surveys;  
c. Lohr: parts of chapter 1 and 2

a. Basic sample designs and their theory for sampling units or elements from a population  
b. Lohr: chapter 2  
http://cran.fhcrc.org/web/packages/survey/index.html; TL 1, 2.1-2.2;  
http://www.ats.ucla.edu/stat/r/  
d. Homework 1 due in class

a. Stratified sampling  
b. Lohr: chapter 3  
c. Homework 2 due in class

a. Ratio estimation  
b. Estimation of nonlinear functions of totals, Taylor linearization  
c. Bias-Variance trade-off and mean squared error  
d. Lohr: chapter 4  
e. Homework 3 due in class

5. Monday, February 23, 2015  
a. Nonlinear estimation, continued  
b. Review for Exam 1  
c. Homework 4 due in class

a. Exam 1 in class: material from homework assignments 1-4  
b. Cluster sampling  
c. Lohr: chapter 5; TL 3.2, 3.3

7. Monday, March 16, 2015  
a. Discuss exam 1  
b. Cluster sampling, continued  
c. Systematic sampling as a form of cluster sampling  
d. Homework 5 due in class

a. Unequal probability sampling  
b. Lohr: chapter 6  
c. Homework 6 due in class

a. Unequal probability sampling, continued  
b. PPS sampling  
c. Homework 7 due in class
10. Monday, April 6, 2015  
   a. Nonresponse: weighting and imputation  
   b. Lohr: chapter 8  
   c. Review for exam 2  
   d. *Homework 8 due in class*  
11. Monday, April 13, 2015  
   a. *Exam 2 in class*: material from homework 5-8  
   b. Variance estimation  
   c. Lohr: chapter 9  
12. Monday, April 20, 2015  
   a. Discuss exam 2  
   b. Variance estimation, continued  
   c. *Homework 9 due in class*  
13. Monday, April 27, 2015; Last day of classes  
   a. Brief discussion of two topics  
   b. Categorical data analysis: Lohr chapter 10  
   c. Two-phase sampling: Lohr chapter 12  
   d. *Homework 10 due in class*  
14. Tuesday, April 28, make up day, no class, [http://www.gwu.edu/academic-calendar](http://www.gwu.edu/academic-calendar)  
15. Wednesday, April 29, 2015; Designated Monday  
   a. Review for final exam  
   b. Questions from students  
16. Final Exam (Monday May 4 – Tuesday May 12): see registrar for exam schedule.