Syllabus for Statistics 6287, Modern Theory of Sample Surveys
The George Washington University
Michael D. Larsen
Class meets 6:10pm – 8:40pm.
2020 K Street, Room 15

Särndal, Swensson, and Wretman’s (SSW)
Lumley’s book (TL)
SAS: http://citl.gwu.edu/pages/sas.html
R: http://www.r-project.org/ (download)

1. Wednesday, August 31, 2011
   a. Introduction to Statistics 6287
   b. Introduction to sample surveys; SSW chapter 1; TL 1
   c. Sample inclusion indicators, p(s); SSW 2.1-2.5
   d. π-estimator and its properties; SSW 2.6-2.8
   e. Confidence intervals, SSW 2.11
2. Wednesday, September 7, 2011
   a. π-estimator and its properties; SSW 2.6-2.8
   b. SSW 3.3; SI, simple random sampling; TL 2.1
   c. SSW 2.9 with replacement sampling
   d. SSW 2.10 design effects; TL 1.1
      http://cran.fhcrc.org/web/packages/survey/index.html ; TL 1, 2.1-2.2;
      http://www.ats.ucla.edu/stat/r/ http://cran.r-project.org/manuals.html
   f. Homework 1 due in class
3. Wednesday, September 14, 2011
   a. BE, Bernoulli sampling; SSW 2.8-2.11, 3.2
   b. SY, systematic sampling; SSW 3.4
   c. PO, Poisson sampling; SSW 3.5
      http://www.ats.ucla.edu/stat/sas/topics/survey.htm
   e. Homework 2 due in class
4. Wednesday, September 21, 2011
   a. π-ps sampling; SSW 3.6
   b. pps sampling; SSW 3.6
   c. Stratified sampling; SSW 3.7; TL 2.2, 2.6
   d. Design effects; SSW 3.8
   e. R and SAS for unequal probability sampling
   f. Homework 3 due in class
5. Wednesday, September 28, 2011
   a. Cluster sampling; SSW 4.1, 4.2; TL 3.1
   b. R and SAS for single stage cluster sampling
   c. Review for Exam 1
   d. Homework 4 due in class
6. Wednesday, October 5, 2011
   a. Exam 1 in class: material through SSW 3.8; material from lectures 1-4
   b. Cluster sampling, two stages, SSW 4.3; TL 3.2, 3.3
   c. R and SAS for cluster sampling
7. Wednesday, October 12, 2011
   a. Discuss exam 1
b. Cluster sampling; SSW 4.5-4.6
   c. Cluster sampling, multiple stages; SSW 4.4
   d. R and SAS for cluster sampling
   e. Homework 5 due in class

8. Wednesday, October 19, 2011
   a. Estimating a ratio; SSW 5.1, 5.6; TL 5.1
   b. Taylor linearization; SSW 5.5
   c. Bias, MSE, consistency; SSW 5.2-5.4
   d. Population mean via ratio estimation; SSW 5.7; TL 5.1
   e. Ratio estimation in R and SAS
   f. Homework 6 due in class

9. Wednesday, October 26, 2011
   a. Population domain via ratio estimation; SSW 5.8; TL 2.5, 5.1
   b. Estimating variance, covariance, and regression coefficients; SSW 5.9-5.10; TL 5.2-5.3
   c. Estimating a median; SSW 5.11; TL 2.4
   d. Simulation and/or case study
   e. Homework 7 due in class

10. Wednesday, November 2, 2011
    a. Auxiliary variables and the difference estimator; SSW 6.1-6.3
    b. Review
    c. Homework 8 due in class

11. Wednesday, November 9, 2011
    a. Exam 2 in class: material from lectures 5-9
    b. Regression estimator; SSW 6.4-6.6

12. Wednesday, November 16, 2011
    a. Discuss exam 2
    b. Regression estimators for element designs; SSW 7; TL 5.2; TL 7
    c. Regression estimation in R and SAS
    d. Homework 9 due in class

THANKSGIVING BREAK

13. Wednesday, November 30, 2011
    a. Regression estimators for element designs; SSW 7; TL 5.2; TL 7
    b. Regression estimators for cluster designs; SSW 8
    c. Homework 10 due in class

14. Wednesday, December 7, 2011
    a. Regression estimators for cluster designs; SSW 8
    b. Computing in R and SAS: calibration preview
    c. Preview of the spring semester: parts III and IV of the book plus supplemental material
    d. Review for final exam
    e. Homework 11 due in class

15. Wednesday, December 14, 2011
    a. Final exam: see registrar for exam schedule and location.
    b. Most likely exam is during regular class time period during exam week.

During Statistics 6287: Fall of 2011: TL 4 on graphics

In Statistics 8688: Spring of 2012: SSW III & IV; TL 2.3 on replicate weights; TL 6, 8-10