Syllabus of **STAT 574S** Sampling: design and analysis

Spring 2015

Course website: http://cals.arizona.edu/~anling/STAT574/STAT574S.htm

Instructor information

Dr. Lingling An
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Office Hours: 1-2pm (Wed.)

Time and location:

Mon & Wed 10:30 -11:45 am (Shantz 338)

Description:

Techniques of statistical sampling in finite populations with applications in the analysis of sample survey data. Topics include simple random sampling for means and proportions, stratified sampling, cluster sampling, two-stage sampling, non-response, and categorical data analysis in complex surveys, etc.

Prerequisite: A good introductory course on Statistics that covers probability distributions, sampling distributions, hypothesis testing, and simple linear regression.

Credits: 3

Purpose of Course:

To acquaint graduate students with the methodologies and issues associated with modern survey sampling. The course strikes a balance between application and theory. Implementation of formulae via computer packages is considered.

Primary audience:

Graduate students with majors in Statistics or students from Pharmacy, Public Health, Biology, Engineering, Geography, Ecology, Education, Sociology, or Psychology who want to learn about designing and analyzing data from sample surveys.

Textbook: Lohr, S. L. (2010). Sampling: Design and Analysis. Pacific Grove, CA: Duxbury.

Topics	*Book Sections*	*Time Commitment*
Elements of the Sampling Problem	*1,2,4*	*4 weeks*
Probability samples; simple random sampling; sample-size estimation; systematic sampling; ratio estimation; regression estimation		
Stratified Sampling/Cluster Sampling	*3,5*	*5 weeks*
Stratified sampling; quota sampling; poststratification; one-stage cluster sampling. two-stage cluster sampling		
Sampling with Unequal Probabilities/complex surveys	*6 ,7*	*3 weeks*
One-stage sampling with replacement; two-stage sampling with replacement; unequal-probability sampling without replacement; sampling weights		
Advanced Topics	*8, 10, 12,13*	*3 weeks*
Nonresponse; two-phase sampling; capture-recapture estimation, categorical data analysis in complex survey		*15 weeks*

Software: SAS

- SAS 9.4. A 6- or 12- month license is available through CatSoft at the university bookstore
- Computer labs:
  ECE229, McClelland Park 102, Shantz 338,

Homework:

There will be about 5 homework assignments due in class. Permission for late submissions should be obtained from the instructor in advance.

Project:
One final project. Each group consists of 2 students. The project involves analysis of survey data, preparation of a technical report and presentation. The report will be due the last day of class and presentation (15~20 min) will be scheduled the last week of class.

Exams:
One in-class midterm exam and one final exam.

Grading Scheme:

Midterm exam: 25%
Homework: 30%
Final exam: 30%.
Project: 15%

A: 90 - 100
B: 80 -89
C: 70 -79
D: 60 -69
E: 0 - 59