

STATISTICS 890-4
STATISTICAL ANALYSIS OF SAMPLE SURVEYS

Summer 2003
DAY COURSE

Instructor: Sarath Banneheka

Prerequisite:

STAT 330 (or MATH 372) or permission of the instructor. Students with credit for MATH 304 may not take STAT 410 for further credit.

Textbook:

Sampling Design and Analysis by Sharon Lohr, published by Duxbury Press.

This course develops the statistical theory required for constructing and analyzing complex sample surveys. Applications discussed may include e.g., the Gallup Poll, market surveys, the Canadian Labour Force Survey, and forest surveys.

1. **The Role of Randomization in Sample Surveys:** Bias, standard error, and root mean squared error, survey techniques.
2. **Simple Random Sampling:** Using random number generators and tables to take a simple random sample, the sampling frame, estimating means, totals, and proportions, the finite population correction factor, confidence limits, probability of error, use of the normal approximation, choosing the sample size.
3. **Stratified Random Sampling:** Advantages of stratification, estimating gains in precision, confidence limits, optimal allocation, sizes, effects of errors in calculated stratum sizes and in optimal allocation, stratification after selection.
4. **Ratio and Regression Estimates:** Purpose and examples, bias, standard error, confidence limits, optimal allocation, weak dependence on usual regression assumptions.
5. **Systematic Sampling:**