

UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DEPARTMENT: MATHEMATICS

DATE: June 1994

Mathematics 410
NAME & NUMBER OF COURSE

Model Assisted Survey Sampling
DESCRIPTIVE TITLE

3
UCFV CREDIT

CATALOGUE DESCRIPTION: The theory and application of model assisted survey sampling. The properties of estimators for single, two-stage and multi-stage cluster sampling, two-phase stratification and regression; optimal and suboptimal design strategies for model based population; the effects of nonsampling, nonresponse and measurement errors. The data quality policies of Statistics Canada are presented.

COURSE PREREQUISITES: Math 350

COURSE COREQUISITES: None

HOURS PER TERM FOR EACH STUDENT	Lecture	60 hrs	Student Directed	
	Laboratory	hrs	Learning	hrs
	Seminar	hrs	Other - specify:	
	Field Experience	hrs	<hr/>	hrs
			TOTAL	60 HRS

UCFV CREDIT ₁
TRANSFER

UCFV CREDIT ₂
NON-TRANSFER

NON-CREDIT ₃

TRANSFER STATUS (Equivalent, Unassigned, Other Details)

UBC credits TBA

SFU credits TBA

UVIC units TBA

Other

Math Curr. Committee
COURSE DESIGNER

J.D. TUNSTALL Ph.D.
DEAN OF ACADEMIC STUDIES

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COURSES FOR WHICH THIS IS A PREREQUISITE:	RELATED COURSES
None	Math 350

TEXTBOOKS, REFERENCES, MATERIALS (List reading resources elsewhere)

TEXTS: Model assisted survey sampling: Sarndal, Swensson and Wretman. Springer-Verlag, New York Inc. New York (1992).

OBJECTIVES:

This course is designed to enable students to:

1. become familiar with the techniques used in the analysis of model assisted survey sample results;
2. gain a cohesive theoretical framework from which to apply the methods of model assisted survey sampling;
3. gain an understanding of the nonsampling, nonresponse and measurement errors that can arise in survey sampling.

METHODS:STUDENT EVALUATION PROCEDURE:

In-class participation	5%
Project	10%
Midterm exams	30%
Final exam	40%
Assignments	15%

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COURSE CONTENT

Topics covered will include:

1. Review of probability sampling: inclusion probabilities, mean and variance of sampling distributions, element sampling designs.
2. Cluster sampling: properties of estimators in single stage, two stage and multi stage cluster sampling, regression estimators in cluster sampling.
3. Two phase sampling: stratification estimators and properties, difference estimators and properties, regression estimators and properties. Sampling on two occasions.
4. Optimal and suboptimal designs: model based optimal designs, model based stratification designs, allocation problems in stratified random sampling and two stage sampling.
5. Nonresponse problems: characteristics, measurement techniques, randomized response, estimation in the presence of nonresponse.
6. Measurement errors: underestimation risk, repeated measures, interviewer effects, interpenetrating subsamples.
7. Further topics: finite population parameters in multivariate and correlation analysis; data quality policies of Statistics Canada.