DE LA SALLE UNIVERSITY
College of Science
Department of Mathematics

SAMPTHE – Introduction to *Sampling Theory*
Prerequisite: Stathe1
Prerequisite to:

Instructor:
Consultation Hours:

Contact details:
Class Schedule and Room:

Course Description

This is a course introducing the student to the basic principles of sampling. This course includes the steps to be undertaken in conducting sample surveys, theoretical discussion, on the different sampling designs (simple random sampling, and multi-staged cluster sampling) estimation procedures using the various designs, sample size estimation as well as variance reduction techniques.

Learning Outcomes

On completion of this course, the student is expected to present the following learning outcomes in line with the Expected Lasallian Graduate Attributes (ELGA)

ELGA	Learning Outcome
Critical and Creative Thinker Effective Communicator Lifelong Learner Service- Driven Citizen	At the end of the course, the students will apply appropriate sampling theories in designing surveys that is appropriate for some real-life problems.

Final Course Output

As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term.

Learning Outcome	Required Output	Due Date
At the end of the course, the students will apply appropriate sampling theories specifically in designing surveys based on problems in the real world.	An inquiry-based group project highlighting the use of sampling theories in designing surveys to answer problem encountered in the real world.	Week 13

Rubric for assessment

CRITERIA	EXEMPLARY 4	SATISFACTORY 3	DEVELOPING 2	BEGINNING 1
Formulation of the Research Problem and Objectives (10%)	Research problem and objectives are clearly defined and significantly demonstrates evidence that the research problem was researched and designed well.	Research problem and objectives are clearly defined and significant	Research problem is clearly defined but some objectives are insignificant.	Research problem and objectives are vague and insignificant
Correct Application of Sampling Theories and Concepts (35%)	Application of sampling theories and concepts are appropriate with correct interpretations and relevant conclusions.	Application of sampling theories and concepts are appropriate with correct interpretations.	Some sampling theories are inappropriate in designing surveys.	Application of sampling theories in designing surveys inappropriate.
Depth of Analysis (30%)	The analysis convinces the reader about the wisdom of conclusions, implications and consequences	The analysis engages the reader to appreciate the wisdom of conclusions, implications and consequences on	The analysis has limited ideas that do not explain the wisdom of conclusions, implications and consequences on	The analysis has incorrect ideas and conclusions.

		the basis of statistical methods and findings.	the basis of statistical methods and findings.	
Clarity and Organization of Written Report (10%)	Written report is organized logically and presented clearly with effective transitions.	Written report is organized logically and presented clearly.	Written report is organized and some discussions are not clear.	Written report is not organized.
Oral Presentation (15%)	Overall presentation is creative and well organized with innovative ideas.	Overall presentation is creative and well organized.	Overall presentation is organized.	Overall presentation is not organized.

Additional Requirements

- Inquiry Plans/Activities
- Skills Check
- Mid Term Exam
- Final Exam

Grading System

	FOR EXEMPTED STUDENTS (w/out Final Exam)	FOR STUDENTS with FINAL EXAM	
		with no missed quizzes	*with one missed quiz*
Average of quizzes	79%	55%	45%
Class Participation	7%	5%	5%
Final Project	14%	10%	10%
Final examination	--	30 %	40%

Scale:

95-100%	4.0
89-94%	3.5
83-88%	3.0
78-82%	2.5
72-77%	2.0
66-71%	1.5
60-65%	1.0
<60%	0.0

Learning Plan

LEARNING OUTCOME	TOPIC	WEEK NO.	LEARNING ACTIVITIES
At the end of the course, the student will apply appropriate sampling theories and concepts in solving various conceptual and real-world problems.	**I. INTRODUCTION** 1.1 Basic Principles 1.2 Finite Population versus Infinite Population Methods 1.3 Census versus Surveys 1.4 The Principal Steps in Sample Survey Operations 1.5 Probability Sampling vs Non-Probability Sampling 1.6 Source of Errors in Surveys 1.7 Statistical Inference in Surveys	6 hours/Weeks 1-2	Prior knowledge and beliefs survey Concept mapping Library work Group discussion and presentations Skills exercises Student self-assessment and reflection
	II. SIMPLE RANDOM SAMPLING (SRS) 2.1 Definition and Purpose 2.2 Notations 2.3 Sample Selection 2.4 Mean and Variance Estimators and their Properties 2.5 Finite Population Correction	9 hours/Week 3-5	

	Factor 2.6 Estimation of Ratios 2.7 Sampling Proportions and Percentages 2.8 Estimation of Sample Size	
	Quiz No.1	1.5 hours/Week 6
	III. STRATIFIED SAMPLING 3.1 Definition and Purpose 3.2 Mean and Variance Estimators and their Properties 3.3 Sample Allocation 3.4 Construction of Strata 3.5 Relative Precision over SRS 3.6 Estimation of Sample Size	4.5 hours/Week 6-7
	IV. SYSTEMATIC SAMPLING 4.1 Linear Systematic Sampling 4.2 Circular Systematic Sampling 4.3 Variance Estimation 4.4 Some Issues Concerning Systematic Sampling	3hours/Week 8
	V. CLUSTER AND MULTI- STAGE SAMPLING 5.1 Cluster Sampling 5.2 Two Stage Sampling 5.3 Stratification in Cluster Sampling 5.4 Efficiency of Cluster Sampling Designs 5.5 Sample Size Determination	12 hours/Week 9-11
	Quiz No.2	1.5 hours/Week 12
	VI. RATIO AND REGRESSION ESTIMATION 6.1 Ratio Estimators 6.2 Properties of the Ratio Estimator 6.3 The Regression Estimator 6.4 Properties of the Regression Estimator 6.5 Efficiency	3 hours/Week 12
	Inquiry-based Group Project	3 hours/Week 13
	Final Examination	2 hours/Week 14

References

Cochran, W. G. (1977). Sampling Techniques, (3rd edition). New York: Wiley
Kish Leslie, (1995) Sampling Techniques, (3rd edition) Wiley Interscience
Yates, Frank.,(1981). Sampling Methods and Censuses (4th Edition). Hodder Arnold
Jessen R.J.,(1978) Statistical Survey Techniques New York: Wiley
Lohr, Sharon L.,(1999). Sampling: Design and Analysis. Pacific Grove: Duxbury Press

Online Resources

Virtual Laboratories in Statistics. Accessed October 25,2012 from: http://www.math.uah.edu/stat/
Siegrist and York (1997) Virtual Laboratories in Statistics. Accessed October 25,2012 from:
http://www.fmi.uni-sofia.bg/vesta/Virtual Labs/index.html
Statistical Theory. Accessed October 25,2012 from: http://statlink.tripod.com/id4.html

Class Policies

1. The required minimum number of quizzes for a 3-unit course is 3, and 4 for 4-unit course. No part of the final exam may be considered as one quiz.
2. Cancellation of the lowest quiz is not allowed even if the number of quizzes exceeds the required minimum number of quizzes.
3. As a general policy, no special or make-up tests for missed exams other than the final examination will be given. However, a faculty member may give special exams for
   A. approved absences (where the student concerned officially represented the University at some function or activity).
   B. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious.
4. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination.
5. If the student has no valid reason for missing an exam (for example, the student was not prepared to take the exam) then the student receives 0% for the missed quiz.
6. Students who get at least 89% in every quiz are exempted from taking the final examination. Their final grade will be based on the average of their quizzes and other prefinal course requirements. The final grade of exempted students who opt to take the final examination will be based on the prescribed computation of final grades inclusive of a final examination. Students who missed and/or took any special/make-up quiz will not be eligible for exemption.
7. Learning outputs are required and not optional to pass the course.
8. Mobile phones and other forms of communication devices should be on silent mode or turned off during class.
9. Students are expected to be attentive and exhibit the behavior of a mature and responsible individual during class. They are also expected to come to class on time and prepared.
10. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed.
11. Students who wish to go to the washroom must politely ask permission and, if given such, they should be back in class within 5 minutes. Only one student at a time may be allowed to leave the classroom for this purpose.
12. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course.
13. Only students who are officially enrolled in the course are allowed to attend the class meetings.

Approved by:

DR. ARTURO Y. PACIFICADOR, JR.
Chair, Department of Mathematics