**MAKERERE UNIVERSITY**
**MAKERERE UNIVERSITY BUSINESS SCHOOL**
**DEPARTMENT OF APPLIED STATISTICS AND MANAGEMENT SCIENCE**
**SAMPLING DISTRIBUTION COURSE OUTLINE FOR**
**ACADEMIC YEAR: 2024/2025 SEMESTER I**
**BACHELOR OF BUSINESS STATISTICS**

## Course Code (BBM2102)

**Course Description**:
This course is aimed at explaining what sampling is all about and of what importance it is in the business environment. This course will further enhance students with skills relating to the different methodologies used in the selection of samples from the target population. In addition to the skills obtained, the students will also understand the different methods employed in sampling and how practical sampling is done in the real-life business cycle and its shortcomings that may arise.

**Course Objectives**:

- To teach students the difference between samples and populations and be able to construct samples from any population.
- To teach students estimation techniques based on given sample information and how to minimize sampling errors.
- To teach students how to do inferences using statistic on parameters.

**Learning Outcomes**:

At the end of the course, student will be able to;

- Understand the concept of sampling
- Describe the different methods of sampling
- Determination of the sample size
- Construct confidence intervals for means and proportions
- Calculate how big a sample is needed to obtain reliable estimates of a population mean a population proportion.
- Calculate a point estimate and a confidence interval estimate of the population mean.
- Calculate the sampling distribution of the mean of a small sample from a small population
- Appreciate the sampling as a tool of better results and applications
- Be able to design a sample survey.

## Detailed Course Content:

| Part | Topics | Sub-topics | Hours |
|---|---|---|---|
| 1 | Introduction to sampling | • Sources of data<br>• Definitions of key terminologies like population and sample<br>• Examples of national sample surveys<br>• Why sample, sampling frame and how to sample<br>• Sampling and non-sampling errors | 5 |
| 2 | Simple random sampling | • Simple random sampling with replacement | 6 |

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| | | • Simple random sampling without replacement<br>• Estimating population mean, ratio and proportion and their confidence intervals | |
| 3 | Sample size determination | • Choice of sample size, n, for computing population mean, total and proportion | 4 |
| 4 | Stratified random sampling | • Definition, advantages and disadvantages<br>• Estimating population mean, ratio and proportion and their variances<br>• Sample size allocation | 4 |
| 5 | Systematic sampling | • Advantages and dis- advantages<br>• Sampling interval | 4 |
| 6 | Cluster sampling | • Advantages and disadvantages<br>• Equal sized clusters<br>• Un-equal sized clusters<br>• Estimating population mean, ratio and proportion and their variances | 6 |
| 7 | Probability proportional to size sampling | • PPS of individuals with replacement<br>• Lahiri Method<br>• Estimation of parameters | 4 |
| 8 | Multi stage sampling | • Introduction, advantages and disadvantages | 4 |
| 9 | Designing a sample survey | • Principal steps in a sample survey | 8 |

**Mode of Delivery:**

- *Straight lectures*
- Tutorials
- Group discussions
- Take home assignments

***Mode of Assessment***

- Test and coursework assignments 30%
- Written final examination 70%
- Total 100%

In order to successfully complete this course, the student must score with at least 50% based on the above assessment criteria.

**READING LIST:**

Anderson, R., J. Kaspar and M. Frankel (1979). Total Survey Error., Jossey Bass,SanFrancisco.Survey error beyond, and including, sampling error.

Belson, W. A(1986). Validity in Survey Research. Gower, Aldershot, England.

Blankenship, A.B (1977). Professional Telephone Surveys.. McGraw Hill.

Briggs, C (1986). Learning How to Ask. Cambridge University Press, Cambridge.Bulmer, Martin and Donald Warwick (1983). Social Research in Developing Countries: Surveys and Censuses in the Third World.. John Wiley, New York, NY.

Cochran, William G. (1977) Sampling Techniques, 3rd edition, John Wiley, Newyork.

Sudman (editors). Measurement Errors in Surveys. John Wiley, New York. Thorough discussion of the various errors in surveys, with 32 contributed chapters. Sources of errors include questionnaire design, nonresponse, interviewers and interviewer-respondent interaction. Modeling of measurement errors.