

M. G. Science Institute, Ahmedabad

Autonomous | Affiliated to Gujarat University, Ahmedabad

(Managed by The Ahmedabad Education Society)

Department of Statistics

Bachelor of Science (Hons.) in Statistics

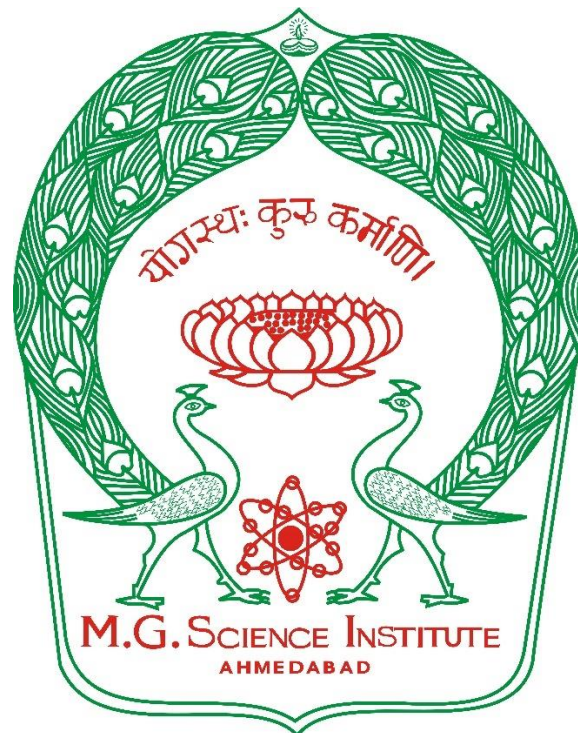
B.Sc. (Hons.) Statistics

4 Year, 8 Semester Full-Time Programme

Choice Based Credit System (CBCS) & Grading System

Outcome-Based Education Pattern

(Effective from Academic Year 2024-25)



STM361 Sampling Techniques

Semester: VI	Course Title:	Credit: 4
Course No.: STM361		Hours: 4/week

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVE ABILITIES	COURSE OUTCOMES
CO 1	REMEMBERING	Recall fundamental concepts and methods of simple random, stratified, systematic, and two-stage sampling.
CO 2	UNDERSTANDING	Explain properties, merits, and limitations of various sampling techniques.
CO 3	APPLYING	Apply sampling methods to estimate population parameters, standard errors, and sample sizes.
CO 4	ANALYSING	Analyse the efficiency of different sampling techniques and compare their precision.
CO 5	EVALUATING	Evaluate sampling strategies and allocation methods based on cost and precision considerations.
CO 6	CREATING	Design appropriate sampling plans for real-life survey and experimental studies.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1	0	0
CO 2	2	3	2	1	0
CO 3	1	2	3	2	1
CO 4	0	1	2	3	2
CO 5	0	1	2	3	3
CO 6	0	0	1	2	3

Unit	Detailed Syllabus	No. of Hours of Teaching
I	<p>Simple Random Sampling</p> <ul style="list-style-type: none"> - Simple Random Sampling with and without replacement and their properties. - Methods of selecting a simple random sample - Estimation of population mean, total and proportion, Standard error and estimation of standard errors - Confidence Limits for Population Mean and Total, Estimation of sample size 	15
II	<p>Stratified Random Sampling</p> <ul style="list-style-type: none"> - Meaning of stratification, stratified sampling and stratified sample - Estimation of population mean and total, standard error of estimators and estimation of standard errors. - Allocation - Proportional, Neyman and Optimum allocations for fixed precision. 	15

	<ul style="list-style-type: none"> - Determination of sample sizes when (i) variance of stratified mean is known and (ii) when total cost of sampling (C) is known - Comparison between stratified sampling and Simple Random Sampling - Merits and demerits of stratified sampling 	
III	<p>Systematic Sampling</p> <ul style="list-style-type: none"> - Idea of systematic sampling - Advantages and limitations of systematic sampling - Estimation of the population mean and standard error of the estimator. - Comparison of systematic sampling ($N = nk$) with SRSWOR and stratified sampling. 	15
IV	<p>Two Stage Sampling</p> <ul style="list-style-type: none"> - Concept of two state sampling - Estimator, variance of estimator. Unbiased estimator of variance of estimator - Estimation of m_{opt} and n_{opt} 	15

Suggested Reference Books:

1. Murthy, M.N: Sampling Theory and Methods, (Statistical Probability Society, Calcutta.
2. Cochran, W.G: Sampling Techniques, Wiley Eastern Ltd.
3. Desraj: Sampling Theory, Tata Mc Graw Hill.
4. Singh, D. and Chaudhary, F.S.: Theory and Analysis of Sample survey, John Wiley and Sons.
5. Mukhopadhyay, P. (1998): Theory and Methods of Survey Sampling, Prentice Hall.
6. Goon, A.M., Gupta, M.K. and Das Gupta, B. (1991): Fundamentals of Statistics, Vol. II,
7. Mukhopadhyay, P. (1999): Applied Statistics, World Press, Calcutta.
8. Gupta, S. C. And Kapoor, V. K. (2005): Fundamentals of Applied Statistics, Sultan Chand & Sons.