St. Xavier's College (Autonomous), Ahmedabad
Syllabus of Semester – IV of the following departments under Faculty of Science
based on Under Graduate Curriculum Framework – 2023 (NEP)
to be implemented from the Academic Year 2023-24.

FACULTY OF ARTS

DEPARTMENT OF STATISTICS

Course	Title	Content		Hours/Week	Credit
Minor-I (Theory)	Sampling Methods	U-1:	Introduction to sampling, Types of sampling methods	4 hrs	**4**
		U-2:	Sampling design and implementation		
		U-3:	Sampling error and estimation		
		U-4:	Sampling in qualitative and survey research		

Minor-I (Theory) Sampling methods

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 04 Credit)			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	**Practical**	**Experiential Learning**		
Sampling methods	4	0	0	10 + 2 from a recognized board in any stream	Basic Mathematics, Observation & Analytical Skills

Course Outcomes:

CO-1   To understand the importance of sampling in social science research.
CO-2   To familiarize students with different sampling techniques and their applications.
CO-3   To develop skills in designing, implementing, and evaluating sampling strategies.
CO-4   To analyze sampling errors and their implications for research findings.

Learning Outcomes: After completion of this course, the students will be able to

(1) Find different sampling techniques and their applications in real life.
(2) Skills to design sampling plans tailored to specific research questions or situations.
(3) comprehend sources of bias and error in sampling, including selection bias, non-response bias, measurement error, and sampling variability.

Unit: 1 Introduction to sampling, types of sampling methods   **(15Hrs)**

- Definition and importance of sampling
- Population vs. sample
- Sampling frame and sampling units
- Probability sampling methods:
    - Simple random sampling
    - Systematic sampling
    - Stratified sampling
    - Cluster sampling
- Non-probability sampling methods:
    - Convenience sampling
    - Purposive sampling
- Snowball sampling

Unit: 2 Sampling design and implementation   **(15Hrs)**

- Sampling plan development
- Sample size determination for mean and proportion,
- Margin of error and Confidence intervals
- Sampling procedures and techniques
- Sampling bias and its mitigation

Unit: 3 Sampling Error and Estimation   **(15Hrs)**

- Types of sampling errors
- Measures of sampling error
- Estimation of population mean & proportion

Unit: 4 Sampling in qualitative and survey research   **(15Hrs)**

- Sampling in Qualitative Research
    - Qualitative sampling techniques
    - Sampling strategies in qualitative research
    - Issues and challenges in qualitative sampling
- Sampling in Survey Research
    - Survey sampling methods
    - Questionnaire design and sampling considerations
    - Sampling weights and adjustments

Teaching Methodology: Apart from the conventional blackboard teaching, other modes of teaching that will be adopted are power points, group discussions, quizzes, class tests, problem-solving, and assignments.

References:

1. Sampling: Design and Analysis by Sharon L. Lohr

2. Survey Sampling by Leslie Kish

3. Sampling Techniques by William G. Cochran

Additional Resources:

- Journal articles on sampling methods and applications
- Online resources and tutorials on sampling techniques