Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	**B.A. / B.Sc. (LIBERAL EDUCATION)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Theory of Estimation and Sampling Survey**	**Course Code:**	**ST201**	**Type:**	**Theory**
Credits	**05**			**Total Sessions Hours:**	**75 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**50 Marks**		**End Term Exam:**	**50 Marks**
Type of Course	○ Compulsory	● Core		○ Creative	○ Life Skill
Course Objectives	1. To aware the students with the need of estimation and understanding the characteristics of a good estimator using data from different distributions. 2. It will teach students to review the probability and non-probability sampling techniques and identify the most appropriate method to select a sample in any real life scenario. 3. This paper will cover concepts such as survey sampling and complete enumeration, point and interval estimation, unbiasedness, consistency, efficiency and their applications.				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Understanding of the concept of estimation, point and interval estimation, properties of an estimator and identification of the type of estimation required for a given practical problem.
CO2	Student will learn about different methods of estimation, use of maximum likelihood estimation and method of moments to find the point estimates for unknown parameters.
CO3	Knowledge of sampling and its need from practical point of view, conceptual knowledge of simple random sampling along with technique to generate a random sample from a finite population, Identifying different sampling techniques to be used under a given situation.
CO4	Students will be familiar with non-probability sampling techniques and their appropriate usefulness over probability sampling techniques.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 20 Marks Activity: 10 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	Parameter, Statistic, Estimator, Estimate, Point estimation, Characteristics of a good estimator, Unbiasedness, consistency,	14	CO1

	sufficiency and efficiency. Problems and examples, Interval estimation. **Activity:** Assignment based activity.		
Unit 2	Methods of Estimation: Method of Maximum Likelihood and properties of MLE (without proof). Method of least squares and methods of moments for estimation of parameters. **Activity:** Assignment based activity.	20	CO2
Unit 3	Sampling vs. Complete enumeration, Samplings Errors, Non-Sampling Errors, Probability Sampling: Simple Random sampling , Use of random number tables in selection of simple random sample, Simple random sampling with replacement, Simple random Sampling without replacement, Stratified random sampling, Systematic Sampling **Activity:** Assignment based activity.	16	CO3
Unit 4	Non-Probability Sampling: Convenience Sampling, Purposive Sampling, Judgement Sampling, Quota Sampling, Snowball Sampling , Advantages and disadvantages of Probability and Non-Probability Sampling. **Activity:** Assignment based activity.	10	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					2					1		1	
CO2	1									1				
CO3	3		1			1	2		3	2	2	1	2	
CO4	2					2			3	1			1	

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. Goon, A.M., Gupta, M.K. and Dasgupta, B. (2013). Fundamental of Statistics, Vol I, World Press, Kolkata. 2. Cochran, W.G. (2007). Sampling Techniques. (Third Edition), John Wiley & Sons, New Delhi. 3. Sukhatme, P.V. and Sukhatme, B.V. (1970). Sampling Theory Surveys with Applications (Second Edition), Iowa State University Press.
Reference Books	1. Gupta, S.C. and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Sultan Chand and Sons. 2. Des Raj. (1976). Sampling Theory. Tata McGraw Hill, New York. (Reprint 1979).
Para Text	**Unit 1:** 1. 2. https://www.youtube.com/watch?v=qvR7sSGphQ4 **Unit 2:** 1. https://www.youtube.com/watch?v=B2mzYhUl-8o 2. https://www.youtube.com/watch?v=Klx4D3cze8o **Unit 3:** 1. https://www.youtube.com/watch?v=iv4gS80gWVk

	2. **Unit4:** 1. https://www.youtube.com/watch?v=sKtoW5cXt14&t=91s 2. https://www.youtube.com/watch?v=gOsNjUCFETg

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	20	**Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **0.5 mark.** **Section B:** Contains **07** descriptive questions out of which **05** questions are to be attempted. Each question carries **03 marks**.
Activity	10	Will be decided by subject teacher
Class Test	05	Contains **05 descriptive questions.** Each question carries **01** mark.
Online Test/ Objective Test	05	Contains **10 multiple choice questions.** Each question carries **0.5** mark.
Assignment/ Presentation	05	Assignment to be made on topics and instruction given by subject teacher
Attendance	05	As per policy
Total Marks	**50**	

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Signature:

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