

17HS040 Sampling Techniques and Design of Experiments

COURSE DESCRIPTION AND OBJECTIVES

To discuss various sampling techniques that can be used to select potential respondents to a survey. The objective of a descriptive survey study is simply to obtain certain information about a population of interest. The objective of an analytical survey study is to make comparisons between different subgroups of a population. The objective of Design of Experiments (DOE) is to establish optimal process performance by finding the right settings for key process input variables. Design of Experiments is a way to intelligently form frameworks to decide which course of action you might take.

COURSE OUTCOMES

After the completion of the course, the student will be able to achieve the following outcomes:

COs	Outcomes
1	Draft a sampling technique for a survey.
2	Able to assess different errors that occur in a sample surveys
3	Apply the principles of design for the efficiency of the investigation
4	Providing an understanding of interactions among causative factors.
5	Determining the levels at which to set the controllable in order to optimize reliability

SKILLS

- ✓ Conduct a sample survey and assess the errors
- ✓ Discuss different sampling techniques for different purposes
- ✓ Design the experiments with principles of design
- ✓ Carry out the analysis for the design of experiments

Unit-I

Sampling Theory: Principle steps in a sample survey, Censuses versus sample survey, sampling and Non-sampling errors. Types of sampling - subjective, probability and mixed sampling methods.

Unit-II

Simple Random Sampling: Meaning of Samples and methods to draw, estimation of population mean, variances in SRSWR & SRSWOR.

Unit-III

Stratified random sampling: Proportional and optimum allocation of sample sizes in stratification. Variances in these methods. Systematic sampling : Systematic sampling when $N = nk$ comparison of their relative efficiencies. Advantages and Disadvantages of above methods of sampling.

Unit-IV

Analysis of Variance: One way with equal and unequal classifications and two way classifications.

Unit - V

Design of Experiments: Principles of experimentation in Designs, analysis of completely randomised design (CRD), Randomised block design (RBD) and Latin square design (LSD) including one missing observation . efficiency of these designs and concept of factorial Experiment.

Text Books:

- 1.Telugu Academy BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference Books:

- 1.Fundamentals of applied statistics : VK Kapoor and SC Gupta.
- 2.Indian Official statistics - MR Saluja.
- 3.Anuvarthita Sankyaka Sastram - Telugu Academy.