

Semester	<b>THREE</b>
Paper Number	<b>HSTCR3062T</b>
Paper Title	<b>Survey Sampling and Indian Official Statistics</b>
No. of Credits	<b>6</b>
Theory/Composite	<b>Composite</b>
No. of periods assigned	Th: 4 Pr: 3
Module	Single
Course description/objective	<p><i>At the end of the course a student should be able to understand</i></p> <ul style="list-style-type: none"> <li>○ The need for probability sampling when we cannot assume any population distribution.</li> <li>○ Different sampling schemes and situations where these are applicable.</li> <li>○ The importance of introducing auxiliary variable in the improvement of estimation procedures under certain situations.</li> <li>○ The sources and mechanisms of collecting official statistics in India.</li> </ul>
Syllabus	<p><b>UNIT1:</b> Concept of population and sample, complete enumeration versus sampling, sampling and non-sampling errors. Types of sampling: non-probability and probability sampling, basic principle of sample survey, simple random sampling with and without replacement, definition and procedure of selecting a sample, estimates of: population mean, total and proportion, variances of these estimates, estimates of their variances and sample size determination. [16L]</p> <p><b>UNIT 2:</b> Stratified random sampling: Technique, estimates of population mean and total, variances of these estimates, proportional and optimum allocations and their comparison with SRS. Practical difficulties in allocation, estimation of gain in precision, Systematic Sampling: Technique, estimates of population mean and total, variances of these estimates (<math>N=n \times k</math>). Comparison of systematic sampling with SRS and stratified sampling in the presence of linear trend and corrections. [12L]</p> <p><b>UNIT 3:</b> Ratio &amp; Regression methods of estimation in simple random sampling . Hartley-Ross estimator. Cluster sampling (equal clusters only) estimation of population mean and its variance, Concept of sub sampling. Two-stage Sampling, Estimation of Population mean and variance of the estimate, comparison between two-stage, cluster and uni-stage sampling [17 L]</p>

	<p><b>UNIT 4:</b> Present official statistical system in India, Methods of collection of official statistics, their reliability and limitations. Role of Ministry of Statistics &amp; Program Implementation (MoSPI), Central Statistical Office (CSO), National Sample Survey Office (NSSO), and National Statistical Commission. Government of India's Principal publications containing data on the topics such as population, industry and finance. [7L]</p>	
List of Practical	<ol style="list-style-type: none"> <li>1. To select a SRS with and without replacement.</li> <li>2. For a population of size 5, estimate population mean, population mean square and population variance. Enumerate all possible samples of size 2 by WR and WOR and establish all properties relative to SRS.</li> <li>3. For SRSWOR, estimate mean, standard error, the sample size</li> <li>4. Stratified Sampling: allocation of sample to strata by proportional and Neyman's methods. Compare the efficiencies of above two methods relative to SRS.</li> <li>5. Estimation of gain in precision in stratified sampling.</li> <li>6. Comparison of systematic sampling with stratified sampling and SRS in the presence of a linear trend.</li> <li>7. Ratio and Regression estimation: Calculate the population mean or total of the population. Calculate mean squares. Compare the efficiencies of ratio and regression estimators relative to SRS.</li> <li>8. Cluster sampling: estimation of mean or total, variance of the estimate, estimate of intra-class correlation coefficient, efficiency as compared to SRS.</li> <li>9. Two stage sampling.</li> </ol>	
Reading/ Reference List	<ol style="list-style-type: none"> <li>1. Cochran, W.G. (1984): Sampling Techniques (3rd Ed.), Wiley Eastern.</li> <li>2. Sukhatme, P.V., Sukhatme, B.V. Sukhatme, S. Asok, C. (1984). Sampling Theories of Survey With Application, IOWA State University Press and Indian Society of Agricultural Statistics.</li> <li>3. Murthy, M.N. (1977): Sampling Theory &amp; Statistical Methods, Statistical Pub. Society, Calcutta.</li> <li>4. Des Raj and Chandhok P. (1998): Sample Survey Theory, Narosa Publishing House.</li> <li>5. Goon A.M., Gupta M.K. and Dasgupta B. (2008): Fundamentals of Statistics, Vol-II, World Press.</li> <li>6. Guide to current Indian Official Statistics, Central Statistical Office, GOI, and New Delhi. <a href="http://mospi.nic.in/">http://mospi.nic.in/</a></li> </ol>	
Evaluation	<p style="text-align: center;"><b>Theory</b></p> <p>CIA: 10 End-Sem: 50</p>	<p style="text-align: center;"><b>Practical</b></p> <p>Continuous assessment: 40</p>

	Total: 60	
Paper Structure for End Sem Theory	Short questions (5 marks each)	Long questions (15 marks each)
	4 out of 6	2 out of 3