

## **STAT- 922 Advanced Sampling Techniques (3 Credit Hours)**

### 1. Objectives

This course aims to introduce students to the advanced sampling procedures, methods and their statistical properties.

### 2. Course Contents

Complex Estimators in Simple Random Sampling (SRS), Chain Estimators in SRS, Stratified Random Sampling, Construction of strata, Separate Ratio, Product and Regression Estimators in Stratified Sampling, Combined Ratio, Product and Regression Estimators in Stratified Sampling, Methods of Removing Bias from the Estimators. Probability is proportional to size (PPS) sampling methods, Use of more than one auxiliary variable in PPSWR, Estimation of the correlation coefficient. Horvitz and Thomson estimator, Multiphase sampling and Multistage sampling. Related applications/computations with R.

### 3. Recommended Books

- i. Cingi, H and Kadilar, C. Advances in Sampling Theory-ratio method of estimation, Bentham Science Publishers (2015).
- ii. Singh, S. Advanced Sampling Theory with Applications. Springer Publishers (2003).
- iii. Zakula, G. Elements of Sampling Theory and Methods, Prentice Hall (1999).
- iv. Cochran, W.G. Sampling Techniques, Jhon Wiley & Sons (1977).
- v. Singh, S. Advanced Sampling Theory with Applications-How Michael selected Amy, Kluwar Academic Publishers (2003).

### vi. 4. Outcomes

On successful completion of this course, students will be able to design and implement statistical sampling and survey for diverse applications.